

FINDING OF NO SIGNIFICANT IMPACT
MILITARY FAMILY HOUSING REVITALIZATION PROJECT
NELLIS AIR FORCE BASE, NEVADA

The attached environmental assessment (EA) analyzes the potential for impacts to the environment as a result of the revitalization of military family housing (MFH) areas at Nellis Air Force Base (AFB). The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code [U.S.C.] 4321 et seq.), the Council on Environmental Quality regulations implementing the procedural provisions of NEPA, 40 Code of Federal Regulations (CFR) Parts 1500-1580, and Air Force policy and procedures (32 CFR Part 989).

This Finding of No Significant Impact summarizes the results of the evaluation of the MFH Revitalization Project. The discussion focuses on activities that have the potential to change both the natural and human environments.

Summary of Environmental Consequences

Initial analysis of resources indicated that project activities would not result in short- or long-term impacts to polychlorinated biphenyls, medical/biohazardous waste, ordnance, and radioactive materials.

The resources analyzed in more detail are socioeconomic, land use, aesthetics, transportation, utilities, hazardous materials management, hazardous waste management, Environmental Restoration Program sites, storage tanks, pesticide usage, asbestos-containing material (ACM), lead-based paint, radon, soils and geology, water resources, air quality, noise, biological resources, cultural resources, and environmental justice.

The MFH Revitalization Project would result in a net decrease of 100 housing units on the base resulting in a decrease of approximately 255 residents on base. This would represent a 4-percent decrease in the current base population and would not be a significant change. The employment associated with the construction activities would represent a temporary increase in the workforce; however, the construction workers are expected to come from the local area, and no permanent increase in the workforce is expected.

Land use within the existing housing areas, and the currently undeveloped parcels of land planned for residential development would be consistent with the planned land uses defined in the base General Plan. One of the existing housing areas would be left vacant after completion of project activities. Although the area is designed for residential use, vacant land is not considered incompatible with this land use designation. The existing and planned future land use for the future fire station site is open space; however, the area that would be disturbed is approximately 1 acre, and impacts would not be considered significant.

Temporary impacts to the aesthetic quality of the area may occur during the renovation, demolition, and construction activities. The MFH areas and adjacent areas on base are considered to have a medium visual sensitivity, and project activities would not degrade the aesthetic quality of these areas.

The increase in population is not expected to increase traffic significantly. The change in on-base population distribution would cause approximately 370 new vehicle trips from the Manch Manor housing area to Nellis AFB Area I during peak-hour periods. This additional traffic is expected to utilize the three closest gates, distributing the volume evenly; therefore, increased traffic through these gates is not expected to represent significant increases compared to the existing traffic volumes. Increases in traffic

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14. ABSTRACT This EA evaluates the potential environmental impacts of the revitalization of MFH areas at Nellis AFB. Project activities could be accomplished by an Air Force contractor or through privatization, in which the MFH units and utilities would be conveyed to a private developer and the developer would be responsible for conducting project activities. Due to advancing age, over 98 percent of the MFH units at Nellis AFB do not meet modern standards. The Office of the Secretary of Defense (OSD), in its current Defense Planning Guidance (DPG) directive has tasked the Department of Defense (DoD) services to revitalize divest through privatization, or demolish inadequate housing by or before fiscal year 2010. In order to comply with the directive and to provide suitable MFH for military personnel stationed at the base, the Proposed Action would include renovating or demolishing inadequate MFH units and constructing new MFH units. This EA has been prepared in accordance with the National Environmental Policy Act to analyze the potential environmental consequences of the Proposed Action, Alternative 1 Alternative 2, and the No-Action Alternative. Under the No-Action Alternative, no activities associated with revitalizing the MFH areas would occur. The Air Force would not be able to comply with the directive or provide suitable MFH for military personnel stationed at the base. Aging and inadequate MFH units would not be renovated or demolished and no new MFH units would be constructed. The Air Force would continue to incur the costs associated with maintaining aging and inadequate MFH units. The environmental resources potentially affected by the Proposed Action are socioeconomics, land use, aesthetics, transportation, utilities, hazardous materials and hazardous waste management (including Environmental Restoration Program sites, storage tanks, pesticide usage, asbestos-containing material, lead-based paint, and radon), soils and geology, water resources, air quality, noise, biological resources, cultural resources, and environmental justice. Based on the nature of activities associated with the revitalization of the MFH areas and the associated renovation, demolition, and construction activities, the Air Force has determined that impacts associated with these resources would not be significant.		
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a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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are expected during project activities; however, these increases would be temporary, and no significant permanent increase in base traffic is expected.

Increases in the consumption of water, wastewater, electricity, or natural gas is not expected on base because population increases would not occur. A short-term increase in solid waste would be generated during project activities; however, the approximately 3,000 tons of solid waste requiring disposal over the duration of the project (i.e., 7 years) would not significantly impact the regional landfill, which currently processes approximately 6,940 tons of waste per day.

Hazardous materials and hazardous waste would be stored, used, and disposed of in accordance with applicable regulations and base management plans. There are no active ERP sites or AOCs within the on-base areas potentially affected by project activities. The aboveground storage tank at Building 3366 (fire station) would be removed prior to commencement of demolition activities. No storage tanks are proposed for installation under the Proposed Action.

Pesticide application practices and types of pesticides applied are not expected to change. Pesticide application would be conducted in accordance with applicable laws and label instructions. Past routine application of chlordane and other pesticides has resulted in pesticide concentration in the soil in the MFH areas that exceed U.S. Environmental Protection Agency preliminary remediation goals for residential areas. Prior to initiation of demolition and construction activities, a health and safety plan would be prepared to address potential hazards to workers and residents from contaminated soil during demolition and construction activities. Sampling and health screening to determine levels of worker safety, potential exposure levels of excavated soils retained on site, and to properly characterize and manage the soil in accordance with federal and state regulations would be conducted. After construction activities are completed, soils in areas not covered by paved surfaces or building foundations would be retested for the presence of pesticides. Pesticide concentrations would be required to be less than their respective residential preliminary remediation goals. Any soils containing pesticide concentrations greater than Resource Conservation and Recovery Act hazardous waste levels that need to be disposed off site would be handled and treated as hazardous waste. No significant impacts are anticipated. Future pesticide application would be conducted according to applicable regulations and label instructions.

Activities where ACM or lead-based paint would be encountered would be conducted in accordance with applicable regulations to minimize impacts. With proper management of ACM, ACM waste, and lead-based paint, no significant impacts are anticipated.

Housing units that have been surveyed and found to have elevated radon levels have been abated. Construction of the new MFH units would incorporate measures to reduce radon levels within the structures.

Compliance with the General Stormwater Permit under the National Pollutant Discharge Elimination System permit and Storm Water Pollution Prevention Plan (SWPPP) and implementation of standard construction practices would reduce the potential for erosion from construction activities. No significant impacts are anticipated.

A net increase in impervious surfaces, which could cause an increase in surface water drainage, may occur. Compliance with the General Stormwater Permit and SWPPP would reduce the potential effect. Proper surface water drainage controls would be incorporated into the design to the housing areas; therefore, flooding incidents within Manch Manor II would no longer be of concern.

Air emissions from demolition and construction activities would be less than 1 percent of the Clark County emission inventory and would be insignificant. Clark County is in nonattainment of the National Ambient Air Quality Standards for carbon monoxide (CO) and particulate matter less than or equal to 10 microns in diameter (PM₁₀). Emissions of CO and PM₁₀ from the Proposed Action would be de minimis and not regionally significant; therefore, the conformity obligation is completed and satisfied. The air emissions from on-base demolition/construction activities would not be regionally significant.

Portions of the existing and proposed housing areas are situated within the day-night average sound level (DNL) 65-decibel (dB) or greater contours and are not considered compatible. Housing in Old Nellis Terrace and the school would be demolished and reconstructed elsewhere. Housing in the portions of Manch Manor within the DNL 65-dB and greater noise contour and in Dunning Circle would be demolished and replaced with new housing. Sound attenuation to meet the local Housing and Urban Development (HUD) standards would be incorporated into all new housing units, as applicable. The existing housing units in New Nellis Terrace that would be retained would be renovated to incorporate sound attenuation features to also meet local HUD standards. Because sound attenuation would be incorporated in the MFH units, no significant impacts are anticipated. Construction activities on base would create noise impacts although impacts would be temporary.

Biological resources would be disturbed during demolition and construction activities. These activities would destroy much of the vegetation and wildlife habitat that is common within the housing areas. The Las Vegas bearpoppy, a state listed species, and the Las Vegas buckwheat, being considered for listing by the state, are found adjacent to and in the 26-acre parcel and in the proposed Manch Manor IV area. Nellis AFB is cooperating with the U.S. Fish and Wildlife Service and the Nevada Division of Forestry to allow any approved agency to collect seeds from either the Las Vegas bearpoppy or the Las Vegas buckwheat. In addition, Nellis is working on the transfer of suitable soil from the 26-acre parcel and proposed Manch Manor IV new construction site to the Las Vegas Springs Preserve to establish new habitat for these species.

There are no prehistoric or historic archaeological properties, historic buildings or structures, or traditional cultural resources within the areas potentially affected by project activities. No significant impacts are anticipated.

Activities associated with the Proposed Action on base would not have substantial effects on any of the resources analyzed in the EA. Therefore, no disproportionately high and adverse human health and environmental effects on low-income and minority populations are anticipated.

Cumulative Impacts

The EA reviewed cumulative impacts that could result from the incremental impact of proposed activities when added to past, present, or reasonably foreseeable future actions.

Residential, commercial, and industrial development and population growth would occur in Clark County and the vicinity of Nellis AFB, and various construction projects may also occur on Nellis AFB during the 7-year time frame for the MFH Revitalization Project. Impacts from other development projects and population growth in the region in conjunction with the impacts from the MFH Revitalization Project present the potential for cumulative impacts. Resource areas for which potential cumulative impacts could occur include socioeconomic, transportation, utilities, air quality, and biological resources.

For socioeconomic and utilities, the impacts of the MFH Revitalization Project are minimal. Even when considered in conjunction with other development on or off base, the increase in population and employment and the increased demand on utility systems would represent such a small percentage of the

cumulative increase that the impacts would not be considered cumulatively significant. Review of individual projects would be undertaken by the appropriate local transportation planners to address the traffic impacts of individual projects and of regional growth, and appropriate traffic improvements and/or other mitigation measures would be identified and implemented by the individual developers and/or state, county, or local transportation departments.

Air emissions from the MFH Reutilization Project construction and demolition activities could contribute to regional air utility impacts. The Clark County Air Pollution Control District would review emissions generated by development projects and implement control measures required for the region to demonstrate attainment of the National Ambient Air Quality Standards.

The loss of native vegetation could contribute to a cumulative loss of native vegetation and wildlife in the region from other development projects on and off base. While this cumulative loss would be an adverse impact to the native desert vegetation and the wildlife that inhabits it, native Mojave Desert vegetation is abundant in the area. Many areas surrounding the Las Vegas Basin are public lands that are unlikely to be developed. Native desert vegetation in these areas is generally protected and would be expected to continue to exist.

Conclusion

On the basis of the findings of the Environmental Assessment, no significant impact is anticipated for the Proposed Action or the No Action Alternative on human health or the natural environment. A Finding of No Significant Impact is warranted and an Environmental Impact Statement is not required for this action.



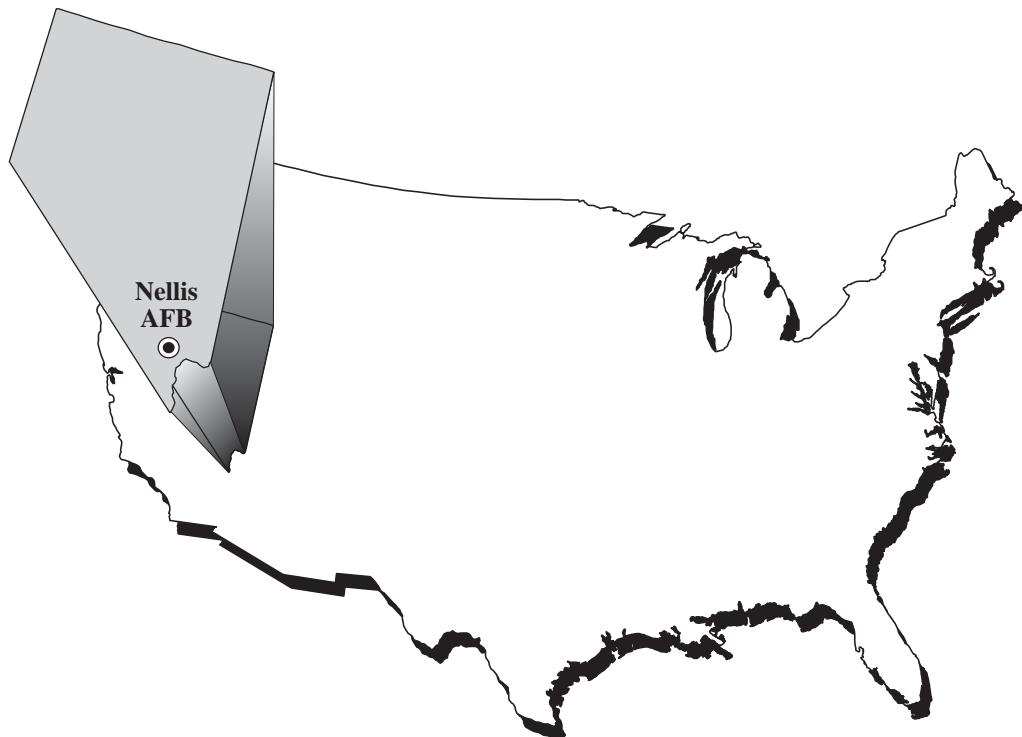
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Vice Commander



Date



**FINAL
ENVIRONMENTAL ASSESSMENT**
February 2005



**MILITARY FAMILY HOUSING
REVITALIZATION PROJECT
NELLIS AIR FORCE BASE
NEVADA**

**FINAL
ENVIRONMENTAL ASSESSMENT
MILITARY FAMILY HOUSING REVITALIZATION PROJECT
NELLIS AIR FORCE BASE, NEVADA**

February 2005

COVER SHEET
PRELIMINARY DRAFT ENVIRONMENTAL ASSESSMENT
MILITARY FAMILY HOUSING REVITALIZATION PROJECT
NELLIS AIR FORCE BASE, NEVADA

- a. Responsible Agency: U.S. Air Force
- b. Proposed Action: Revitalization of the military family housing (MFH) areas on Nellis Air Force Base (AFB), Nevada, which includes renovation of MFH units in New Nellis Terrace, demolition of MFH in Old Nellis Terrace, demolition and construction of MFH units in the Dunning Circle and Manch Manor housing areas, and construction MFH units on two vacant parcels of land adjacent to Manch Manor. Project activities could be accomplished by an Air Force contractor or through privatization.
- c. Written comments and inquiries regarding this document should be directed to: Mr. Robert Lopez, HQ AFCEE/ECA, 3300 Sidney Brooks, Brooks City-Base, Texas 78235-5112; telephone (210) 536-6545.
- d. Report Designation: Environmental Assessment (EA)
- e. Abstract: This EA evaluates the potential environmental impacts of the revitalization of MFH areas at Nellis AFB. Project activities could be accomplished by an Air Force contractor or through privatization, in which the MFH units and utilities would be conveyed to a private developer and the developer would be responsible for conducting project activities. Due to advancing age, over 98 percent of the MFH units at Nellis AFB do not meet modern standards. The Office of the Secretary of Defense (OSD), in its current Defense Planning Guidance (DPG) directive has tasked the Department of Defense (DoD) services to revitalize, divest through privatization, or demolish inadequate housing by or before fiscal year 2010. In order to comply with the directive and to provide suitable MFH for military personnel stationed at the base, the Proposed Action would include renovating or demolishing inadequate MFH units and constructing new MFH units.

This EA has been prepared in accordance with the National Environmental Policy Act to analyze the potential environmental consequences of the Proposed Action, Alternative 1, Alternative 2, and the No-Action Alternative. Under the No-Action Alternative, no activities associated with revitalizing the MFH areas would occur. The Air Force would not be able to comply with the directive or provide suitable MFH for military personnel stationed at the base. Aging and inadequate MFH units would not be renovated or demolished and no new MFH units would be constructed. The Air Force would continue to incur the costs associated with maintaining aging and inadequate MFH units.

The environmental resources potentially affected by the Proposed Action are socioeconomics, land use, aesthetics, transportation, utilities, hazardous materials and hazardous waste management (including Environmental Restoration Program sites, storage tanks, pesticide usage, asbestos-containing material, lead-based paint, and radon), soils and geology, water resources, air quality, noise, biological resources, cultural resources, and environmental justice. Based on the nature of activities associated with the revitalization of the MFH areas and the associated renovation, demolition, and construction activities, the Air Force has determined that impacts associated with these resources would not be significant.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAFES	Army and Air Force Exchange Services
ACC	Air Combat Command
ACM	asbestos-containing material
AFAF	Air Force Auxiliary Field
AFB	Air Force Base
AFI	Air Force Instruction
AHERA	Asbestos Hazard Emergency Response Act
AICUZ	Air Installation Compatible Use Zone
AOC	area of concern
AST	aboveground storage tank
bgs	below ground surface
BMP	best management practice
CAA	Clean Air Action
CAS	Central Accumulation Site
CCSD	Clark County Sanitation District
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CPSC	Consumer Product Safety Commission
CWA	Clean Water Action
dB	decibel
°	degrees
dBA	A-weighted sound levels
DDD	dichlorodiphenylchloroethane
DDE	dichlorodiphenylchloroethylene
DDT	dichlorodiphenyltrichloroethane
DNL	day-night average sound level
DOD	Department of Defense
DPG	Defense Planning Guidance
DRMO	Defense Reutilization and Marketing Office
EA	environmental assessment
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	fiscal year
HUD	U.S. Department of Housing and Urban Development
I	Interstate
IAP	initial accumulation point
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
ITE	Institute for Transportation Engineers
kV	kilovolt
kWH	kilowatt hour
LBP	lead-based paint

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

lead	Pb
LF	linear feet
LOS	level of service
MFH	military family housing
mg/kg	milligram per kilogram
MGD	million gallons per day
MILCON	military construction
MMI	Modified Mercalli intensity
MSA	Metropolitan Statistical Area
MSL	mean sea level
MW	megawatt
NAAQS	National Ambient Air Quality Standards
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NLR	noise level reduction
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PCB	polychlorinated biphenyl
pCi/l	picocuries per liter
PM ₁₀	particulate matter equal or less than 10 microns in diameter
ppm	part per million
PRG	preliminary remediation goal
PVC	polyvinyl chloride
RAMP	Radon Assessment and Mitigation Program
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
SCAQMD	South Coast Air Quality Management District
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SNWA	Southern Nevada Water Authority
SO ₂	sulfur dioxide
SOQ	senior officer quarters
SWPPP	Storm Water Pollution Prevention Plan
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agricultural
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
WPCF	Water Pollution Control Facility

1.0 PURPOSE OF AND NEED FOR ACTION

This Environmental Assessment (EA) evaluates the potential environmental impacts of activities associated with upgrading the military family housing (MFH) at Nellis Air Force Base (AFB), Nevada (Figure 1-1). The MFH Revitalization Project would include renovation, demolition, and construction activities.

This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code [U.S.C.] 4321, et seq.), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force policy and procedures (32 CFR Part 989).

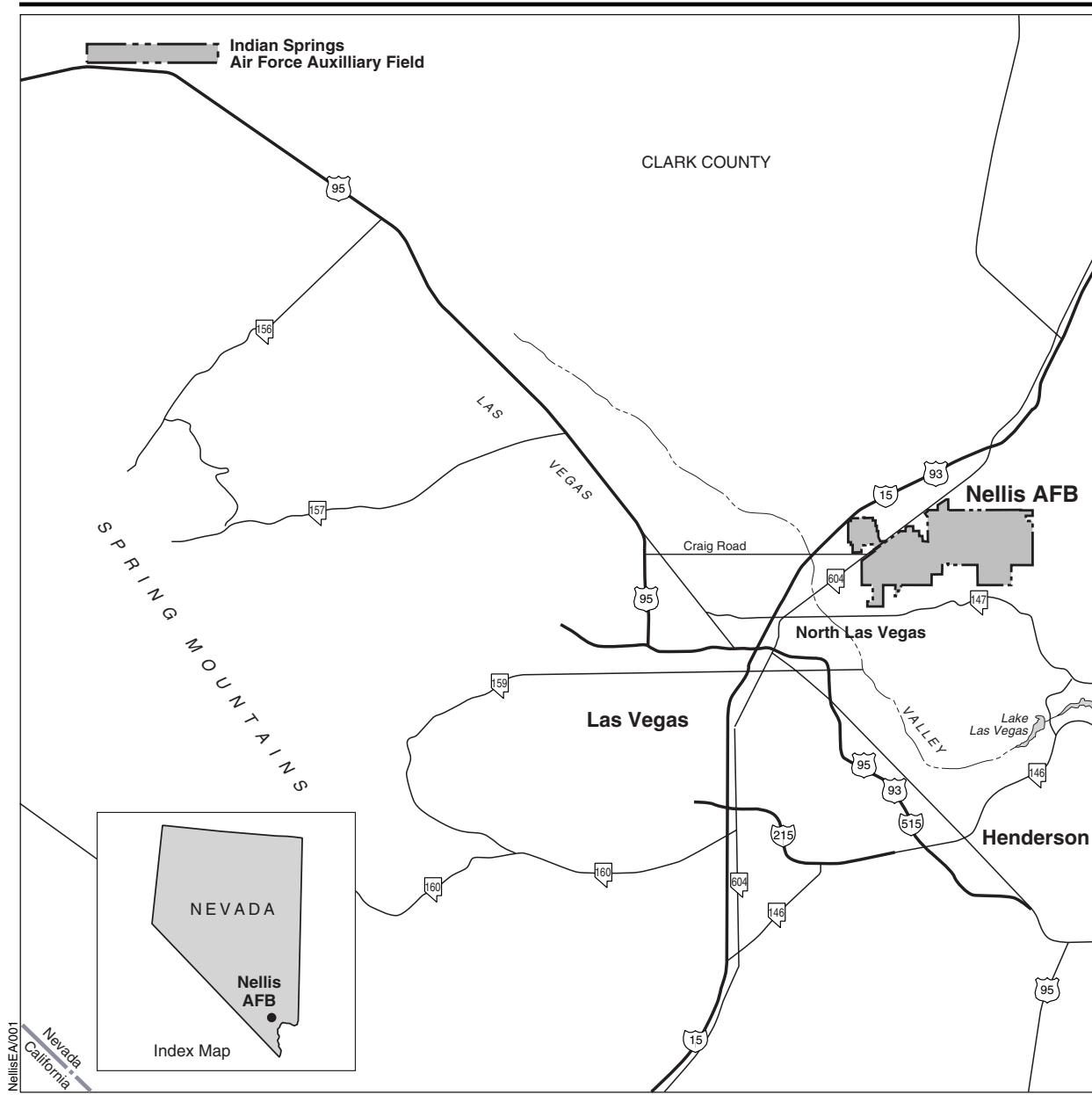
1.1 PURPOSE AND NEED

The purpose of the MFH Revitalization Project is to provide suitable MFH for military personnel stationed at Nellis AFB. This action is needed to comply with the Office of the Secretary of Defense (OSD) Defense Planning Guidance (DPG). The OSD, in its current DPG directive has tasked the Department of Defense (DoD) services to revitalize, divest through privatization, or demolish inadequate housing by or before fiscal year (FY) 2010.

Due to advancing age and continual degradation, over 98 percent of the MFH units at Nellis AFB do not meet modern standards and require either major improvements or replacement. Additionally, many of these units have deteriorated beyond the reasonable cost of whole unit renovation. Therefore, renovation and demolition activities are necessary to comply with the DPG directive.

Therefore, in order to comply with the requirements of the OSD directive, the MFH Revitalization Project includes renovating or demolishing inadequate MFH units and constructing new MFH units. This effort could be accomplished using either traditional construction options (i.e., military construction [MILCON] funding) or through the use of private capital (privatization). Privatization to meet MFH requirements is authorized by the 1996 Defense Authorization Act where housing is geographically separated from or severable from the installation, and the privatization project is economically feasible. Nellis AFB has determined that privatization is feasible for the MFH areas. Privatization would involve the lease of Air Force land and conveyance of Air Force buildings and structures and utilities to a private developer for the purpose of satisfying new construction, replacement, and improvement requirements.

The MFH Revitalization Project would involve the three separate MFH areas on Nellis AFB.



**Nellis Air Force Base
Regional Map**

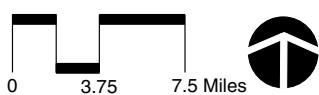


Figure 1-1

1.2 LOCATION OF THE PROPOSED ACTION

Nellis AFB is in southern Nevada, in Clark County, approximately 8 miles northeast of the city of Las Vegas (see Figure 1-1). The base's three MFH areas, Nellis Terrace, Manch Manor, and Dunning Circle, are situated within or adjacent to the main base on Nellis AFB (Figure 1-2). The Nellis Terrace housing area comprises approximately 139 acres on the west-central portion of the base, south of Las Vegas Boulevard. The Manch Manor housing area comprises approximately 182 acres on the northwest portion of the base, situated north of Craig Road. The Dunning Circle housing area comprises approximately 5 acres and is situated northeast of the Nellis Terrace housing area (see Figure 1-2).

1.3 SCOPE OF ENVIRONMENTAL REVIEW

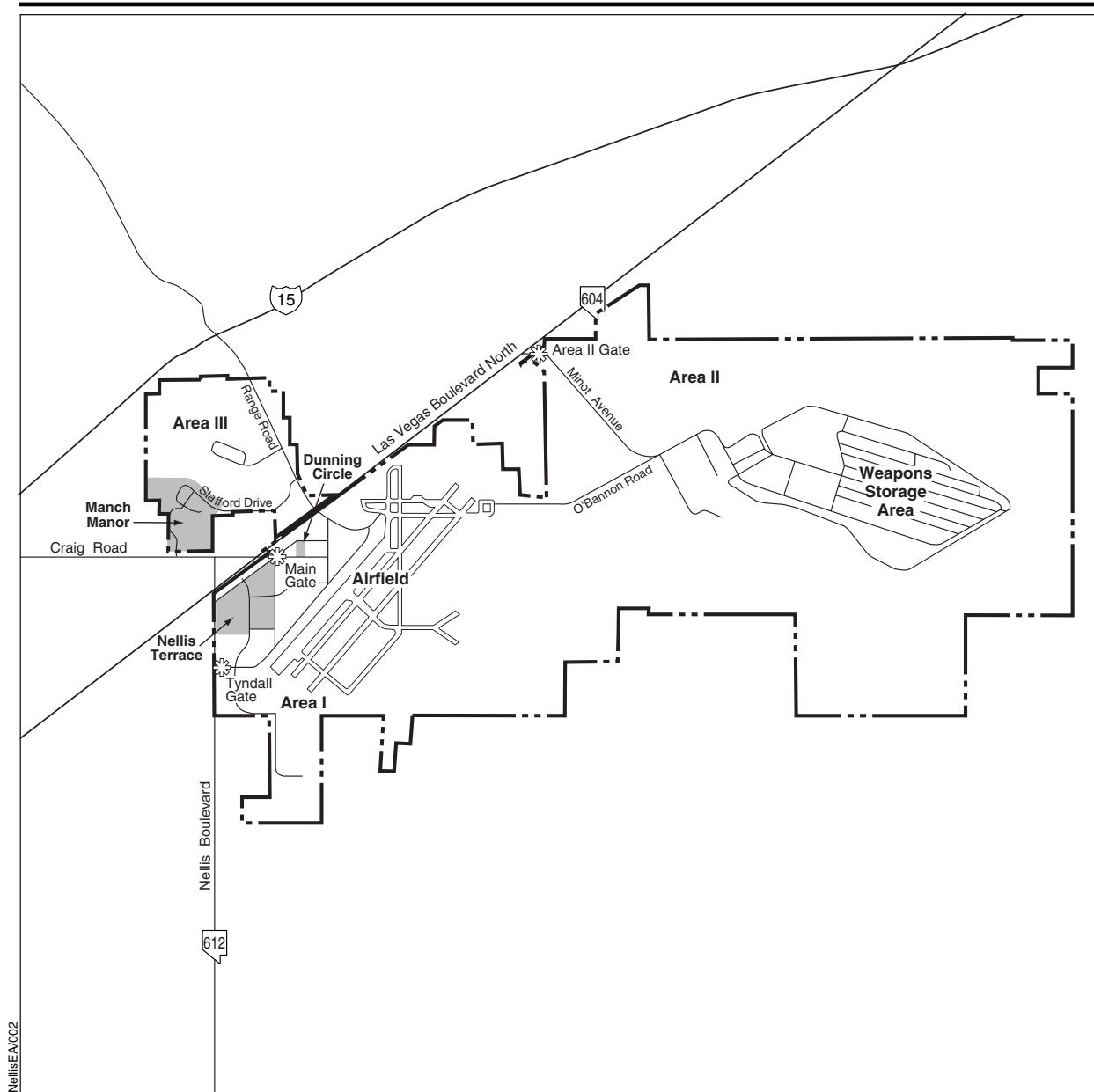
This document is “issue-driven,” in that it concentrates on those resources that may be affected by implementation of the Proposed Action or alternatives. The EA describes and analyzes the potential environmental impacts of the activities associated with the Proposed Action. These activities include the renovation, demolition, and construction of housing units within the Nellis Terrace, Manch Manor, and Dunning Circle housing areas at Nellis AFB.

Consistent with the CEQ regulations, the scope of analysis presented in this EA is defined by the potential range of environmental impacts that would result from implementation of the Proposed Action, Alternative 1, Alternative 2, and the No-Action Alternative.

In response to activities that may be associated with MFH Revitalization Project, the Clark County School District may decide to relocate the Lomie Heard Elementary School, currently situated within the Nellis Terrace housing area, to another location on base property that would be provided by the Air Force. This relocation would be accomplished in an effort to site the school closer to where the majority of the student population would be housed.

Resources that have a potential for impact were considered in more detail in order to provide the Air Force decision maker with sufficient evidence and analysis to determine whether or not additional analysis is required pursuant to 40 CFR Part 1508.9. The resources analyzed in more detail are socioeconomics, land use, aesthetics, transportation, utilities, hazardous materials management, hazardous waste management, Environmental Restoration Program (ERP) sites, storage tanks, pesticides, asbestos-containing material (ACM), lead-based paint (LBP), radon, soils and geology, water resources, air quality, noise, biological resources, cultural resources, and environmental justice. The affected environment and the potential environmental consequences relative to these resources are described in Chapters 3.0 and 4.0, respectively.

Initial analysis indicates that renovation, demolition, and construction activities would not result in short- or long-term impacts to polychlorinated biphenyls (PCBs), medical/biohazardous waste, ordnance, and radioactive materials. The reasons for not addressing these resources are briefly discussed in the following paragraphs.



EXPLANATION

- Interstate Highway
- State Highway
- Base Boundary
- Housing Area
- Entrance Gate



**Nellis AFB
Installation Map**

Figure 1-2

Polychlorinated Biphenyls. Nellis AFB has met the criteria established by the Air Force as being “PCB-free” (Headquarters Air Combat Command, 1998). Transformers and other equipment containing over 50 parts per million (ppm) PCBs have been removed from the base. There is no federally regulated PCB equipment or PCB-contaminated equipment within the Nellis Terrace, Manch Manor, or Dunning Circle housing areas (99th Civil Engineer Squadron, 2002a). Therefore, impacts associated with PCBs are not expected and are not analyzed further in this EA.

Medical/Biohazardous Waste. Medical/biohazardous waste has not been generated within the Nellis Terrace, Manch Manor, or Dunning Circle housing areas, and none would be generated under the Proposed Action or alternatives. Therefore, impacts from medical/biohazardous waste are not expected and are not analyzed further in this EA.

Ordnance. Ordnance has not been stored, used, or disposed of within the Nellis Terrace, Manch Manor, or Dunning Circle housing areas. The Proposed Action and alternatives would not require the use of ordnance. Therefore, impacts from ordnance are not expected and are not analyzed further in this EA.

Radioactive Materials. Radioactive materials have not been stored, used, or disposed of within the Nellis Terrace, Manch Manor, or Dunning Circle housing areas. The Proposed Action and alternatives would not require the use of radioactive materials. Therefore, impacts from radioactive materials are not expected and are not analyzed further in this EA.

1.4 FEDERAL, STATE, AND LOCAL PERMITS, LICENSES, AND FEES

The contractor responsible for conducting renovation, demolition, and construction activities would obtain all required federal, state, and local permits. The developer would cooperate with the Air Force to ensure compliance with applicable Air Force, federal, state, and local regulations and/or requirements. Permits related to environmental concerns that would be required include, but are not limited to, the following: permits for removal and transportation of asbestos during the demolition and renovation of housing units, a Clark County Surface Disturbance permit for dust generated by ground-disturbing activities, and a General Stormwater Permit for general construction.

1.5 RELATED ENVIRONMENTAL DOCUMENTS

The documents listed below have been prepared for Nellis AFB and the Nellis Terrace, Manch Manor, and Dunning Circle housing areas. These documents provided supporting information for the environmental analysis contained within this EA.

The Draft 2001 Nellis AFB Family Housing Master Plan describes the actions and associated costs to provide, operate, and maintain MFH at Nellis AFB (U.S. Air Force, 2001). The plan provides information on new construction, improvements, and operations and maintenance costs necessary to ensure that sufficient quality housing is provided and properly maintained to meet the needs of military families

assigned to Nellis AFB. The plan summarizes the inventory and revitalization requirements at the installation upon the completion of the FY 2003 Military Family Housing Program, as submitted in the FY 2003-2007 Air Force Amended Program Objective Memorandum. The plan also provides an evaluation of the MFH privatization potential.

The F-22 Aircraft Force Development Evaluation and Weapons School Beddown, Nellis AFB Environmental Impact Statement (U.S. Air Force, 1999) provides baseline information for the affected environment at Nellis AFB. The noise contours developed for this EIS were used as the baseline noise contours for the noise analysis in this EA.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and alternatives include the activities associated with the MFH Revitalization Project at Nellis AFB. Activities associated with the project will be discussed in four subsections: Housing; Infrastructure and Utilities; Collateral Facilities; and Landscaping, Common Areas, and Recreational Facilities. Project activities would include renovation, demolition, and construction. Areas that would be affected by the MFH Revitalization Project are shown in Figure 2-1.

Three housing revitalization scenarios, the Proposed Action, Alternative 1, and Alternative 2, as well as the No-Action Alternative are described in this chapter.

The Proposed Action and alternatives analyzed in this EA were selected because they met all of the selection criteria for the MFH Revitalization Project for Nellis AFB. These criteria are:

- a. Comply with the OSD DPG requirement to revitalize, divest through privatization, or demolish inadequate housing by or before FY 2010
- b. Meet the housing requirement identified in the Housing Market Analysis (i.e., 1,178 units at the main base)
- c. Provide housing in a community where military families will choose to live
- d. Provide housing on Air Force-owned property, where available
- e. Not locate Air Force-owned and operated facilities within privatization housing areas.

The MFH Revitalization Project could be accomplished through MILCON funding or privatization. The activities associated with the project would be essentially the same, regardless of which method is used to accomplish the project. Therefore, this EA focuses on the environmental affects of the activities associated with the MFH Revitalization Project and not on the means by which the project is accomplished.

If the MFH Revitalization Project is accomplished through privatization, the Air Force would convey all of the existing MFH units to the privatization developer for renovation and demolition. The Air Force would lease the land to the developer, but would retain ownership. Areas where MFH units are designated for demolition and no new MFH is planned would be leased for up to 7 years or until demolition is completed. Upon completion of demolition, the land would revert to Air Force control and would be available to the base for future use. The remainder of the MFH areas would be leased to the developer for up to 50 years for construction of the new MFH units and long-term maintenance and operation of the MFH areas. Infrastructure, including utilities, would also be conveyed to

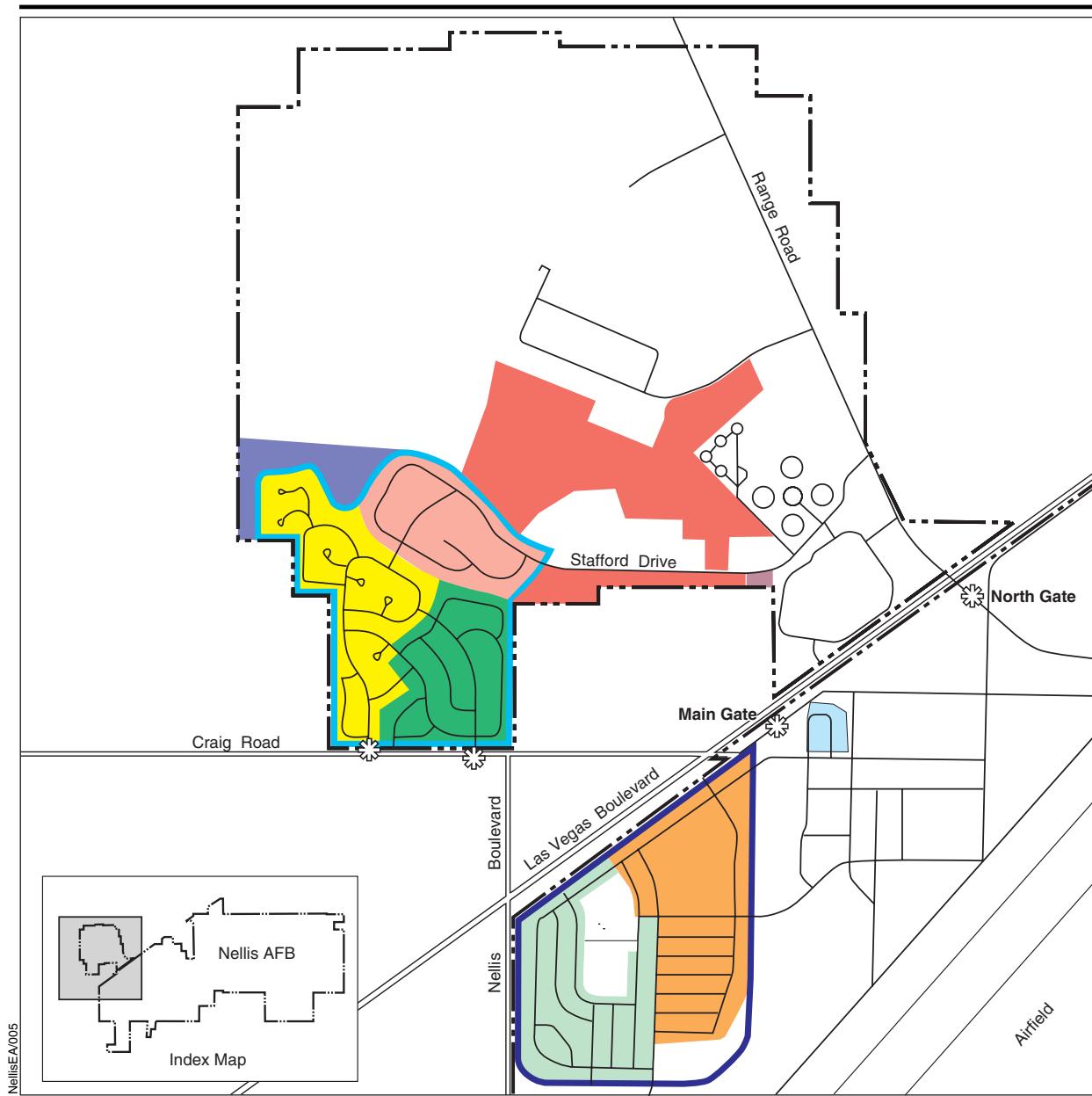


Figure 2-1

the developer. The developer would finance, plan, design, and construct improvements, as well as own and manage the MFH areas.

If the project is accomplished by MILCON funding, the same renovation, demolition, and construction activities would occur; however, the Air Force or its approved contractor would conduct these activities, and the Air Force would retain ownership of the land.

2.1 DESCRIPTION OF THE PROPOSED ACTION

2.1.1 Housing

The Proposed Action would include renovation of 350 MFH units, demolition of 915 units, and construction of 815 units at Nellis AFB. For the purposes of analysis, it is assumed that project activities would begin in September 2004 and that all renovation, demolition, and construction activities would be completed within 7 years, and renovation activities would be completed within 8 years. Nellis AFB would specify certain requirements for the MFH areas such as the total number of housing units required, minimum square footages for each type of unit, the number of units to be built within each housing area, and the minimum number and type of amenities. The schedule for project activities, configuration of neighborhoods, design of housing units, and the incorporation of supplemental amenities to enhance the quality of life would be determined in the MILCON or by the privatization developer.

2.1.1.1 Renovation.

All 350 MFH units within the portion of the Nellis Terrace housing area known as New Nellis Terrace would be renovated (Figure 2-2). The New Nellis Terrace area is approximately 77 acres in size. The housing units were constructed between 1996 and 2000 and generally meet modern development standards. However, this housing area is situated within the 70 to 80 decibel (dB) day-night average sound level (DNL) noise contours. Residential development is generally not considered favorable within this noise contour. Renovation activities for these MFH units would include incorporation of measures to achieve an outdoor to indoor noise attenuation to meet local Housing and Urban Development (HUD) standards. The methods to be used to accomplish the noise attenuation would be determined in the MILCON or by the privatization developer. It has not been determined exactly when the units would be renovated; however, renovations would be scheduled to minimize displacement of residents. Telephone service would be expanded through local vendor plans. Cable television service would be replaced by a new system that is compatible with all units.

2.1.1.2 Demolition.

The Proposed Action would require the demolition of 915 MFH units within a portion of the Nellis Terrace housing area, the majority of the Manch Manor housing area, and all of the Dunning Circle housing area. It has not been determined which units would be demolished each year; however, these activities would be scheduled to minimize or avoid displacement of residents by the

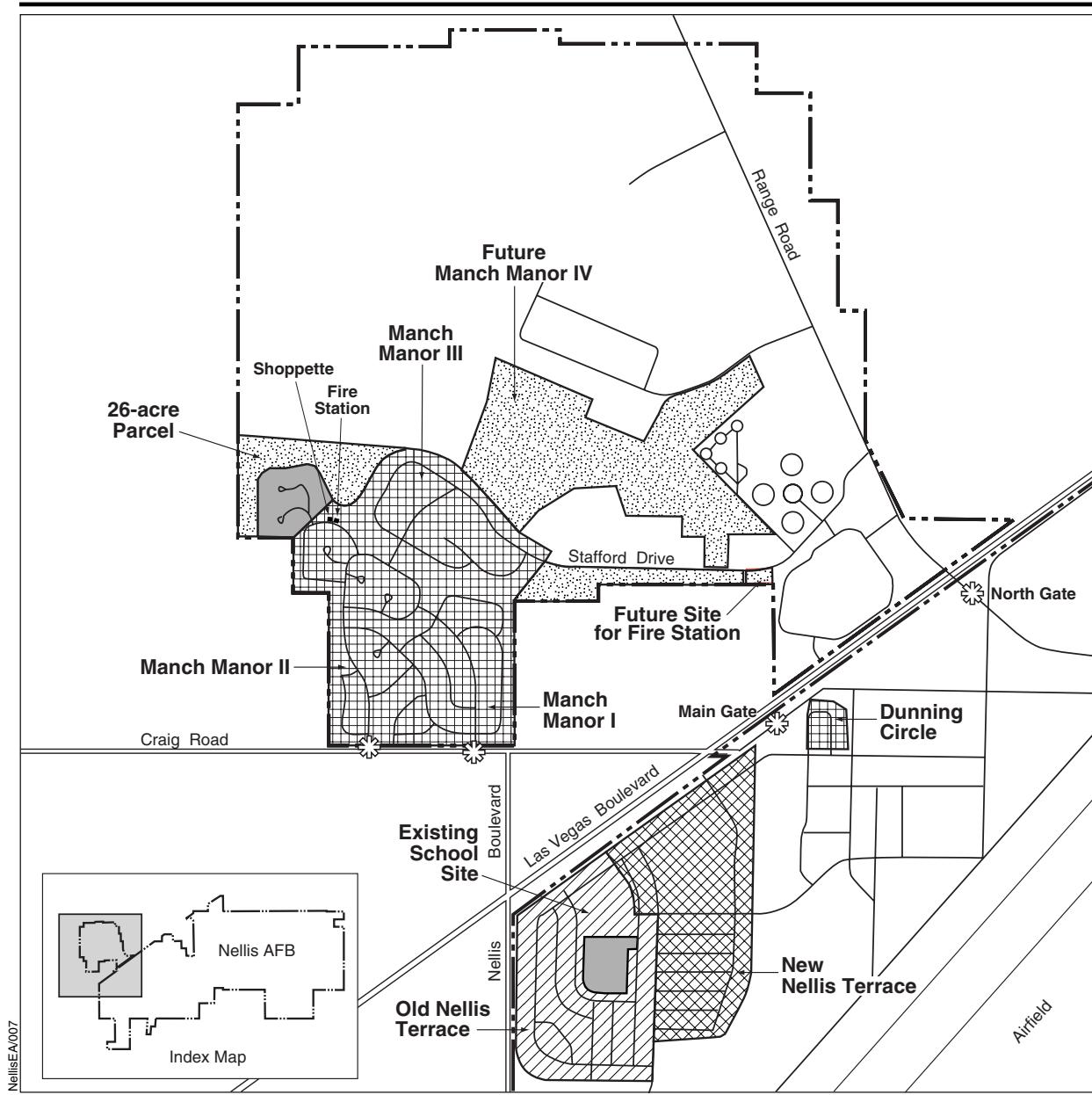


Figure 2-2

prudent scheduling of construction activities and the routine transfer of personnel to and from Nellis AFB.

Old Nellis Terrace. All of the 329 MFH units within the portion of Nellis Terrace housing area known as Old Nellis Terrace would be demolished (see Figure 2-2). The Old Nellis Terrace area is approximately 62 acres in size; the entire parcel would be disturbed during demolition activities. These MFH units were constructed between 1951 and 1954. After demolition activities are complete, the housing lots within Old Nellis Terrace would be left as vacant land and covered with gravel to prevent dust and erosion hazards. The paved areas and utilities are not expected to be demolished and will remain in place. After completion of demolition activities, this area would be available to the base for potential future development.

As discussed in Section 1.3, the Clark County School District may decide to relocate the Lomie Heard Elementary School currently situated on a 9.86-acre leased parcel within the Nellis Terrace housing area. After completion of the Proposed Action, the majority of housing would be situated within the Manch Manor housing area, rather than the Nellis Terrace housing area. Therefore, it has been assumed, for purposes of analysis, that the school would be demolished and relocated. The former school site would be left vacant, covered with gravel to prevent dust hazards, and would revert to Air Force control. This area would also be available to the base for potential future development.

Manch Manor I, II, and III. There are three distinct phases of development within the Manch Manor housing area: Manch Manor I, II, and III (see Figure 2-1). A total of 580 MFH units within Manch Manor I, II, and III would be demolished. These 580 units represent all of the existing housing within Manch Manor I, II, and III except for 13 senior officer quarters (SOQ) housing units. These 13 SOQ units would be retained in their present condition with the exception of communications upgrades (see Figure 2-2). The MFH units to be demolished in the Manch Manor area were constructed between 1960 and 1975. The Manch Manor housing area is approximately 182 acres in size; the entire area, except the area on which the 13 SOQ units are situated, would be disturbed during demolition activities. The new configuration of the housing area would be determined through MILCON or by the privatization developer and is not currently known. However, for the purposes of analysis, it is assumed that the paved areas and existing utilities would not be demolished.

There are three nonresidential facilities within the Manch Manor housing area: the fire station, shoppette, and Building 3000 (administration). The fire station and shoppette would be demolished as part of the Proposed Action. Building 3000, which is currently used as an administration building, may also be demolished.

Dunning Circle. The Proposed Action would require the demolition of all six SOQ housing units within the Dunning Circle housing area (see Figure 2-2). Of the six four-bedroom housing units, five were constructed in 1957, and the remaining unit was constructed in 1968. The Dunning Circle housing area is approximately 5 acres in size; the entire parcel would be disturbed during

demolition activities. The new configuration of the housing area would be determined through MILCON or by the privatization developer and is not currently known. For the purposes of analysis, it is assumed that the paved areas and utilities would be demolished.

2.1.1.3 Construction.

The Proposed Action would include the construction of 815 MFH units at Nellis AFB within the Manch Manor and Dunning Circle housing areas.

Manch Manor. A total of 811 housing units would be constructed within the Manch Manor area. This includes the existing Manch Manor I, II, and III housing areas and a vacant parcel of land situated adjacent to the existing Manch Manor III. This area has been designated as Manch Manor IV (see Figure 2-2). The vacant parcel of land is approximately 86 acres in size. The 811 housing units include the construction of three SOQ housing units on the 26-acre parcel adjacent to Manch Manor II (see Figure 2-2). New infrastructure (roads, driveways, sidewalks, access routes) would be constructed in the 26-acre parcel to accommodate the three new housing units. For the purposes of analysis, it is assumed that the existing paved areas and utilities within the existing Manch Manor housing area would be incorporated into the newly constructed housing area. All 86 acres of Manch Manor IV would be disturbed during construction activities. New infrastructure (roads, driveways, sidewalks, access routes, utilities) would be constructed to accommodate the new housing units.

Two sensitive plant species, the Las Vegas bearpoppy and Las Vegas buckwheat (see Section 3.4.5.3 for a discussion of these species), are present in the Manch Manor IV area and 26-acre parcel. Prior to initiation of construction in these areas, Nellis AFB would allow any approved agency to collect seeds from either of these plant species, and would coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within these areas for transfer to the Las Vegas Springs Preserve. The salvaged topsoil would be used to assist in the creation of a habitat at the preserve for rare plants that occur in the Las Vegas Valley.

The Lomie Heard Elementary School would be relocated to a 10-acre site within the Manch Manor area that would be set aside by the developer for construction and operation of the new school. Construction activities for the school would be conducted by the school district.

Dunning Circle. A total of four SOQ housing units would be constructed at the Dunning Circle housing area. The new configuration of the housing area would be determined through MILCON or by the privatization developer. Although no specific plans or layout for the neighborhood have been determined, for the purposes of analysis it is assumed that the existing paved areas and utilities would not be demolished. Therefore, construction of new roadways and utility lines would not be required.

Construction Practice Requirements. As many new MFH units as possible would be constructed prior to the demolition of existing housing units. Within the Manch Manor housing area, a number of housing units were demolished in past years due to structural defects. At present, there are a number of vacant housing lots that would be immediately available for new construction. Utilizing these lots for new construction prior to the demolition of existing units would minimize or avoid the displacement of current residents.

In accordance with the MFH revitalization requirements, two-bedroom units would be a minimum of 1,340 and a maximum of 1,790 square feet in size, three-bedroom housing units would be a minimum of 1,630 and a maximum of 2,300 square feet in size, and four-bedroom units would be a minimum of 1,950 and a maximum of 2,700 square feet in size. At the completion of project activities, there will be a total of 1,178 housing units on the main base area. These units will consist of 840 2- and 3-bedroom units and 338 4-bedroom units. Housing units may be constructed as a combination of single-family units, multifamily duplex units, or townhouses. No stacked units (dwelling units above each other) would be constructed.

The privatization developer would use design and construction methods and materials that would reduce energy and water consumption. The contractor/developer would be responsible for meeting the Clark County or local codes, standards, regulations, and industry practices or other development standards, as determined by the Nellis AFB Senior Engineer. The contractor/developer would also be responsible for obtaining any required permits. The contractor/developer would cooperate with the Air Force to ensure compliance with applicable Air Force, federal, state, and local regulations and/or requirements.

Traffic patterns associated with the MFH Revitalization Project have not been determined. The traffic routes for the project would be approved by the base prior to the start of project activities. However, for the purposes of analysis, it is assumed that all traffic associated with the renovation, demolition, or construction of housing units on the main base within the Nellis Terrace or Dunning Circle housing areas would enter the base from Nellis Road at the Tyndall Gate. Construction traffic associated with activities at the main base within the Manch Manor housing area would enter the housing area via Craig Road through the existing gates (see Figure 2-1).

The construction contractor or privatization developer would be required to transport and dispose of all hazardous material, construction debris, and hazardous waste (including nonregulated waste such as used motor oil) off site to approved or permitted facilities in accordance with federal, state, and local regulations. The contractor/developer would be required to maintain a hazardous waste accumulation point and designate an individual responsible for the management of the site including the certification, administration, and removal of hazardous waste in accordance with the base's hazardous waste management plan (see Section 3.3.2). If a spill occurs during activities conducted by the contractor/developer, the spill would be cleaned up immediately by the contractor/developer. If ACM, LBP, or other hazardous materials are identified in

areas proposed for demolition, removal and disposal would be conducted by a certified contractor in accordance with applicable federal, state, and local regulations. Prior to initiation of demolition and construction activities, the construction contractor or privatization developer would be required to prepare a health and safety plan in accordance with Occupational Safety and Health Administration (OSHA) requirements that would address potential hazards to workers and residents during demolition and construction activities. If soils where pesticides were applied are excavated, the contractor/developer would be responsible for conducting any additional sampling and health screening to determine levels of worker safety, potential exposure levels of excavated soils retained on site, and to properly characterize and manage the soil in accordance with federal and state regulations. Demolition site controls would be reviewed with the responsible fire department.

2.1.2 Infrastructure and Utilities

New housing units would be connected to existing utility infrastructure (natural gas, electric, water, wastewater) through construction of new utilities lines. In the event that the MFH Revitalization Project is accomplished through privatization, infrastructure such as roads, parking areas, sidewalks, street lighting, utilities, and storm water drainage systems within the MFH areas, with the exception of the overhead electrical distribution system in the Old Nellis Terrace area, would be conveyed to the private developer who would be responsible for their operation and maintenance. This would include the water tower and associated water supply building situated in Manch Manor II (Facilities 1011 and 1012). The overhead electrical distribution system in Old Nellis Terrace is owned by the Nevada Power Company and would not be conveyed.

New access roads to provide direct access between off-base areas and the housing areas would not be constructed as part of the Proposed Action. Currently, access points from off-base areas to Manch Manor I and II are in place, and each of the three existing development phases of Manch Manor can be reached from these points. Although no configuration has been determined for the housing areas, it is likely that these access points would be maintained after the new development and would provide access to Manch Manor I, II, III, and IV. The Nellis Terrace and Dunning Circle housing areas do not currently have direct access points to off-base areas. However, as part of the evaluation of the feasibility of privatizing the housing areas, it was determined that new access roads and fencing could be constructed to effectively sever these housing areas from the main base, if necessary. In the event that the housing is revitalized through privatization and it becomes necessary to allow non-military personnel to live in the housing areas in order to maintain minimum occupancy requirements guaranteed to the privatization developer, the housing areas could be severed from the remainder of the main base. At that time, construction of new access roads would be required so that the residents could access the housing areas without accessing the main base. Appropriate analysis of the potential environmental impacts of this activity would be completed at that time.

2.1.3 Collateral Facilities

Supplemental facilities to support management activities for the housing areas would be constructed. These supplemental facilities include a Maintenance Facility, Management Office, and guard houses. The design and location of these facilities would be determined in the MILCON or by the privatization developer. A guardhouse is expected to be constructed at each entrance to the New Nellis Terrace, Manch Manor I, II, III, IV, and Dunning Circle housing areas.

The fire station and shoppette, which are currently situated in Manch Manor II, would be demolished as part of the Proposed Action. The fire station is owned and operated by the Air Force and would be reconstructed on a parcel of land along the south side of Stafford Drive. The shoppette would not be reconstructed (see Figure 2-2). The fire station, which would support one structural pumper, would be approximately 6,000 square feet in size. Construction of the new fire station would disturb a total area of approximately 1 acre.

2.1.4 Landscape, Common Areas, and Recreational Facilities

Landscaping would be provided within the housing areas. Within the existing MFH areas where new MFH units will be constructed, existing healthy landscaping would be retained as much as possible during demolition and construction activities. Upon completion of construction activities, landscaping would be completed in both the existing and new MFH areas. Landscaping would be constructed around each housing unit, in common areas, and around collateral facilities. The landscaping design and types of plants and materials used would be determined in the MILCON or by the privatization developer.

Recreational facilities would be configured into the housing areas. These facilities would include tot lots, playgrounds, and teenage multipurpose recreation facilities such as a skateboard park, tennis courts, and basketball courts. Other amenities such as a clubhouse, bike trails, picnic areas, dog park, and community swimming pools may be included. The design and locations of these facilities would be determined through MILCON or by the privatization developer.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

2.2.1 Alternative 1

The activities associated with Alternative 1 would be similar to those described under the Proposed Action. The differences in demolition and construction activities are described below.

After the demolition of the six existing SOQ housing units at the Dunning Circle housing area, six new SOQ units would be constructed at this same location; therefore, Dunning Circle would remain a family housing area. Three SOQ units would not be constructed on the 26-acre parcel adjacent to Manch Manor II. One SOQ unit would be constructed within Manch Manor I, II, or III. The Old Nellis Terrace housing units and the school, as well as the paved areas and utilities,

would be demolished. The area would be replanted with native plants. The on-base activities associated with Alternative 1 area shown on Figure 2-3.

As described under the Proposed Action, Nellis AFB would allow seed collection prior to initiation of construction in the Manch Manor IV area and would coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the Manch Manor IV area for transfer to the Las Vegas Springs Preserve.

2.2.2 Alternative 2

The activities associated with Alternative 2 would be similar to those described under the Proposed Action. The differences in demolition and construction activities are described below.

After the demolition of the six existing SOQ housing units at Dunning Circle, the land would be left vacant and the lots would be covered with gravel to prevent dust and erosion hazards. After demolition, the land would revert back to Air Force control and would be available to the base for potential future development. A total of seven new SOQ units would be constructed in the 26-acre parcel adjacent to Manch Manor II. After the demolition of the 329 housing units within Old Nellis Terrace, 171 housing units would be constructed at the same location. The Manch Manor IV area would remain undeveloped.

As described under the Proposed Action, Nellis AFB would allow seed collection prior to initiation of construction in the 26-acre parcel and would coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the 26-acre parcel for transfer to the Las Vegas Springs Preserve.

Because the majority of base housing would remain at Nellis Terrace, the Lomie Heard Elementary School would remain at its current location within the Nellis Terrace Housing Area. No demolition or construction of school buildings by the Clark County School District would occur. The on-base activities associated with Alternative 2 are shown on Figure 2-4.

2.2.3 No-Action Alternative

Under the No-Action Alternative, the renovation, demolition, and construction activities associated with the MFH Revitalization Project would not occur. The MFH areas would remain in their current locations with their current MFH units. No new construction of the fire station would occur. The Lomie Heard Elementary School would not be relocated.

2.2.4 Alternatives Considered but Eliminated from Further Consideration

Several alternatives were considered but eliminated from further consideration because they did not meet all of the selection criteria. These are described briefly below.

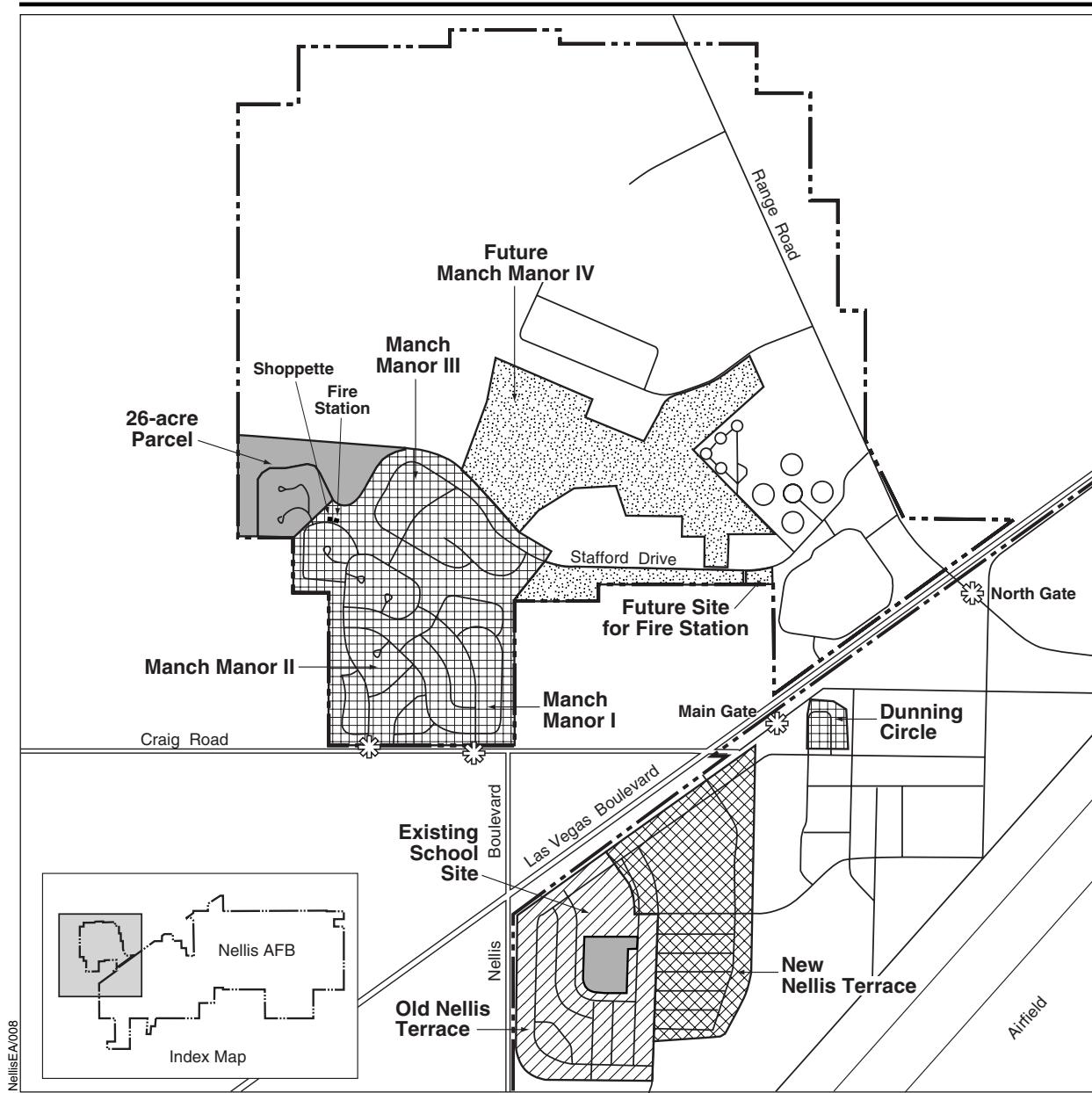


Figure 2-3

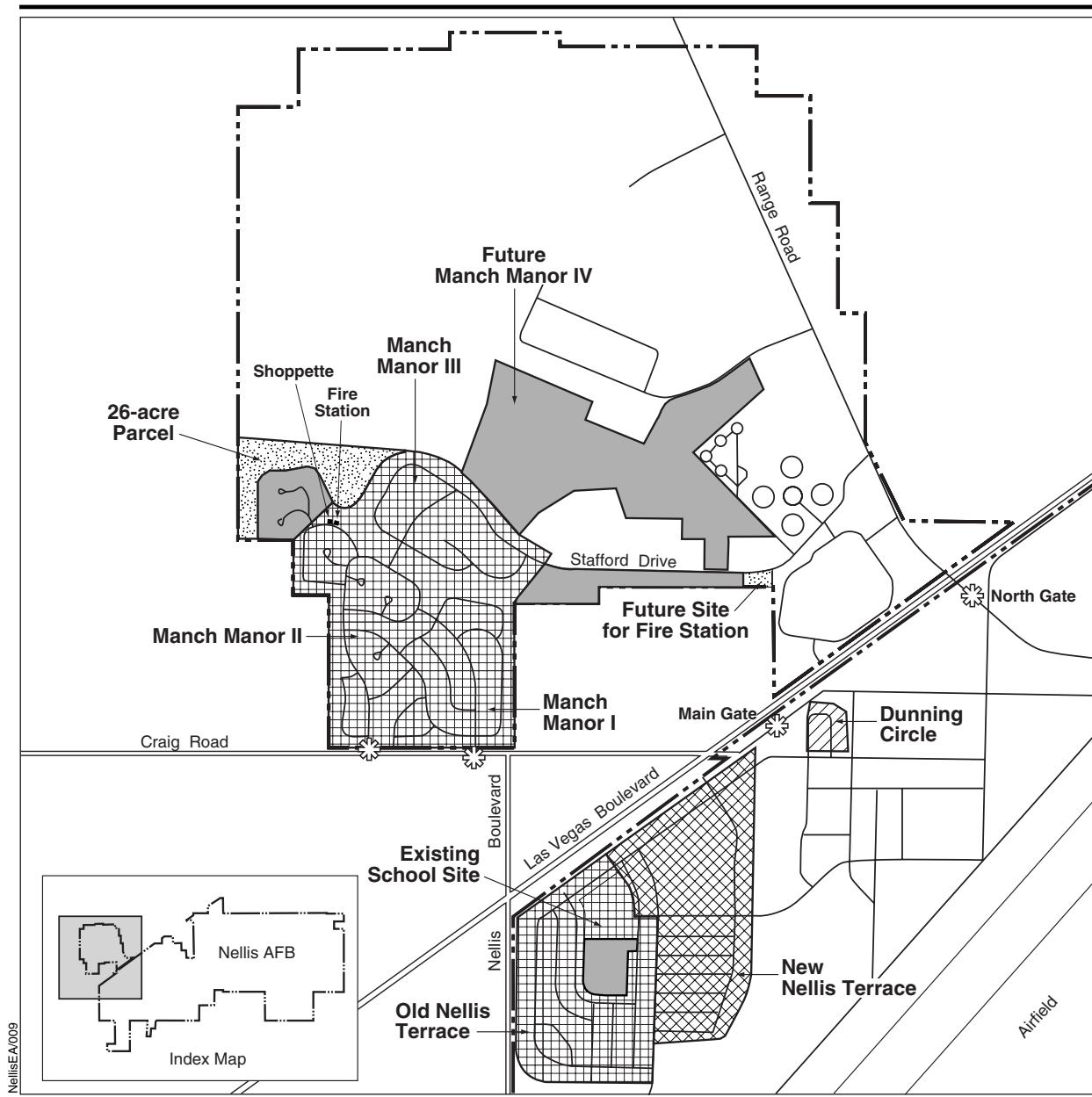


Figure 2-4

Reconstruct the fire station within Manch Manor. The MFH Revitalization Project considers that the MFH areas may be severed from the base should it become necessary. In the event that the MFH areas are privatized, the fire station would be retained by the Air Force. If the fire station was to be situated within the privatized area of Manch Manor and this area were to be severed from the base, this Air Force facility would no longer be within the base boundary. In addition, there would not be sufficient space within the MFH areas for the fire station after completion of the revitalization project. Therefore, this alternative did not meet selection criterion e, to “not locate Air Force-owned and operated facilities within privatization housing areas,” and it was eliminated from further consideration.

Construct 171 housing units on private land outside of the base boundary instead of developing the Manch Manor IV area. Constructing the housing units on privately owned land presents the concern that the Air Force investment in the housing area would be at a greater risk than if the housing units were constructed on Air Force-owned land. Because the Air Force has land available for the housing, use of Air Force-owned property presents less of a risk than utilizing privately owned property. In addition, the cost of land could make this alternative financially unfeasible. Therefore, this alternative did not meet selection criterion d, “provide housing on Air Force-owned property, where available,” and it was eliminated from further consideration.

Abandon the inadequate MFH units. This alternative would entail placing military families in off-base housing as they are assigned to Nellis AFB and abandoning MFH units in place as they become vacant. This alternative was eliminated because abandoning the housing units does not comply with the OSD DPG that inadequate housing be revitalized, divested through privatization, or demolished (selection criterion a). In addition, the Nellis AFB Housing Market Analysis indicates that sufficient adequate off-base housing is not available, and this alternative does not provide the on-base housing requirements identified in that study. Therefore, this alternative also did not meet selection criterion b “meet the housing requirement identified in the Housing Market Analysis,” and d, “provide housing on Air Force-owned property, where available,” and it was eliminated from further consideration.

Demolish the inadequate MFH units. This alternative is similar to the abandoned inadequate MFH units alternative and also would entail placing military families in off-base housing. While this alternative does meet the OSD DPG that inadequate housing be revitalized, divested through privatization, or demolished (selection criterion a), it was eliminated because it does not provide the on-base housing requirement identified in the Nellis AFB Housing Market Analysis, and sufficient adequate housing is not available off base. Therefore, this alternative does not meet selection criteria b and d, and it was eliminated from further consideration.

No other reasonable or feasible alternatives were identified for analysis in this EA.

2.3 COMPARISON OF ENVIRONMENTAL IMPACTS

This section provides a comparative analysis of the potential environmental effects of implementing the Proposed Action, Alternative 1, Alternative 2, and the No-Action Alternative. A detailed discussion is presented in Chapter 4.0, Environmental Consequences.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 1 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Local Community				
Socioeconomics	Impacts: The population residing on base would decrease by approximately 255 people, which represents a 4-percent decrease from the current base population of 6,483. This change would not be significant. No direct changes in employment would be expected. Increased employment associated with construction activities would be temporary.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: No increase in population or employment from baseline conditions is expected.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 2 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Land Use	Impacts: <ul style="list-style-type: none">• Land use in the existing housing areas would remain residential, except for Old Nellis Terrace, which would become vacant land. Vacant land is not considered incompatible with a residential land use designation.• Construction of housing units in Manch Manor IV and the 26-acre parcel would be consistent with future planned land uses for these areas.• The future school site would be situated within an area planned for residential use; however, its proximity to residential areas is similar to that which presently exists.• Land use for the future site of the fire station is open space; however, the area to be disturbed is approximately 1 acre.	Impacts: <p>Impacts would be similar to those described under the Proposed Action, except for the following:</p> <ul style="list-style-type: none">• the 26-acre parcel adjacent to Manch Manor II would not be developed. Vacant land is not considered incompatible with a residential land use designation.	Impacts: <p>Impacts would be similar to those described under the Proposed Action, except for the following:</p> <ul style="list-style-type: none">• Manch Manor IV and Dunning Circle would remain or become vacant land. Vacant land is not considered incompatible with a residential land use designation.• Old Nellis Terrace would remain a residential area and the school would not be relocated.	Impacts: <p>No changes in land use from baseline conditions are expected.</p>

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 3 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Aesthetics	Impacts: Temporary impacts to the aesthetic quality of the area may occur during the renovation, demolition, and construction activities. Project activities would not degrade the medium visual sensitivity aesthetic quality of these areas.	Impacts: Impacts would be similar to those described under the Proposed Action except that the Old Nellis Terrace area would be revegetated with native plants, thereby having a positive aesthetic effect on the area.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: No change to aesthetics from baseline conditions is expected.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 4 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Transportation	Impacts: The population decrease of approximately 255 people is not expected to increase traffic significantly. The Manch Manor housing areas would experience a 62 percent increase in population over current condition. This change in distribution would cause approximately 231 new vehicle trips from the Manch Manor areas to Area I during peak-hour periods. This additional traffic is expected to utilize the three closest gates to Manch Manor, and increased traffic through these gates is not expected to represent significant increases compared to the existing traffic volumes driven by the approximately 10,000 employees at the base.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action, except that the distribution of residents would not change.	Impacts: No change in traffic volumes or patterns from baseline conditions is expected.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 5 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Utilities	Impacts: Population increases would not be significant; therefore, no significant increase demand for water, wastewater, electricity, or natural gas is anticipated. A short-term increase in solid waste would be generated during project activities. Approximately 6,000 tons of solid waste requiring disposal over the duration of the project would not significantly impact the regional landfill, which currently processes approximately 6,940 tons of waste per day.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: No change in utility usage from baseline conditions is expected.
Hazardous Materials/ Hazardous Waste Management	Impacts: Hazardous materials and hazardous waste would continue to be stored, used, and disposed of in accordance with applicable regulations and the base's hazardous waste management plan.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Hazardous materials and waste would continue to be stored, used, and generated by the housing maintenance contractor, in accordance with applicable regulations.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 6 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Environmental Restoration Program Sites/Areas of Concern	Impacts: There are no active ERP sites or AOCs within the areas potentially affected by project activities.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: No change in baseline conditions is expected to ERP sites and AOCs.
Storage Tanks	Impacts: The AST at Building 3366 (fire station) would be removed prior to commencement of demolition activities. No storage tanks are proposed for installation under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Management of the AST at Building 3366 tank would continue in accordance with applicable regulations. No change in baseline conditions is expected.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

Alternative
Page 7 of 13

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Pesticide Usage	Impacts: Pesticide application practices and types of pesticides applied are not expected to change. Pesticide application would be conducted in accordance with applicable laws and label instructions. Past application of pesticides in the MFH areas has resulted in concentrations of chlordane and other pesticides in the soil that exceed U.S. EPA residential PRGs. Prior to initiation of demolition and construction activities, a health and safety plan would be prepared in accordance with OSHA requirements that would address potential hazards to workers and residents from contaminated soil during demolition and construction activities. Sampling and health screening to determine levels of worker safety, potential exposure levels of excavated soils retained on site, and properly characterize and manage the soil in accordance with federal and state regulations would be conducted. After construction activities are completed, soils in areas not covered by paved surfaces or building foundations would be retested for the presence of pesticides. Pesticide concentrations would be required to be less than their respective residential PRGs. Any soils containing pesticide concentrations greater than RCRA hazardous waste levels that need to be disposed off site would be handled and treated as hazardous waste.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: No change in pesticide use from baseline conditions is expected.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 8 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Asbestos-Containing Material	Impacts: ACM may be present in structures that would be demolished. Activities where ACM would be encountered would be conducted in accordance with applicable regulations to minimize impacts.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: ACM would continue to be managed in accordance with Air Force policy and applicable regulations. No change from baseline conditions is expected.
Lead-Based Paint	Impacts: LBP may be present in structures that would be demolished. Activities where LBP would be encountered would be conducted in accordance with applicable regulations to minimize impacts.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: LBP would continue to be managed in accordance with Air Force policy and applicable regulations. No change from baseline conditions is expected.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action
Alternative
Page 9 of 13

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Radon	<p>Impacts: Housing units with radon levels above the recommended action level have been abated. The contractor would be advised of housing units where radon surveys are not available. New housing unit construction would incorporate measures to reduce radon.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: The Air Force would continue to be responsible for the management and abatement of radon within housing units, as under baseline conditions.</p>
Natural Environment				
Geology and Soils	<p>Impacts: Short-term impacts would occur as a result of ground disturbance associated with new construction. Compliance with the General Stormwater NPDES permit and SWPPP and implementation of standard construction practices would reduce the potential for erosion from construction activities.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: No new construction or demolition of existing facilities would occur. No change from baseline conditions is expected.</p>
Water Resources	<p>Impacts: A net increase in impervious surfaces would increase surface water drainage, but compliance with the General Stormwater NPDES permit and SWPPP would reduce the potential effect. Flooding incidents within Manch Manor II would no longer be of concern.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: No new construction or demolition of existing facilities would occur. No change from baseline conditions is expected.</p>

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 10 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Air Quality	Impacts: Construction and demolition activities would produce air emissions. Watering of the construction areas to suppress dust would be used to reduce emissions of particulate matter. Emissions associated with the Proposed Action would increase countywide emissions by less than 1 percent and would not hinder maintenance of the NAAQS. Clark County is in nonattainment of the NAAQS for CO and PM ₁₀ . Emissions of CO and PM ₁₀ would be de minimis and not regionally significant; therefore, a conformity analysis is not required.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: No change in air emissions from construction activities and changes in commuting patterns would occur.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 11 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Noise	Impacts: Portions of the existing and proposed housing areas are situated within the DNL 65 dB or greater contours and are not considered compatible. Housing in Old Nellis Terrace and the school would be demolished and reconstructed elsewhere. Housing in the portions of Manch Manor within the DNL 65-dB and greater noise contour and in Dunning Circle would be demolished and replaced with new housing. Sound attenuation to meet the local HUD standards would be incorporated into all new housing units, as applicable. New Nellis Terrace would be renovated for sound attenuation to achieve an outdoor-to-indoor NLR to meet local HUD standards. Construction activities would create noise impacts; although impacts would be temporary.	Impacts: Impacts would be similar to those described under the Proposed Action.	Impacts: Impacts would be similar to those described under the Proposed Action except that the MFH units in Old Nellis Terrace would be reconstructed and would require sound attenuation to meet local HUD standards. The school would remain within the DNL 70-75-dB contour; because this would not represent a change in existing conditions, it would not be considered a significant impact. In addition, no housing units would be reconstructed in Dunning Circle.	Impacts: No change to the noise environment would occur.

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action

**Alternative
Page 12 of 13**

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Biological Resources	<p>Impacts: Demolition and construction activities would destroy approximately 86 acres of native vegetation and wildlife habitat that is common in the area. Habitat for the Las Vegas bearpoppy, a federal species of concern, and the Las Vegas buckwheat, a rare plant, situated within the 26-acre parcel and in the proposed Manch Manor IV area would be destroyed.</p> <p>Nellis AFB will allow any approved agency to collect seeds from either the Las Vegas bearpoppy or the Las Vegas buckwheat prior to initiation of construction in the 26-acre parcel and proposed Manch Manor IV area.</p> <p>Nellis AFB will coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the 26-acre parcel and proposed Manch Manor IV area for transfer to the Las Vegas Springs Preserve. The salvaged topsoil will be used to assist in the creation of a habitat at the preserve for rare plants that occur in the Las Vegas Valley.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action except approximately 74 acres would be revegetated as native desert vegetation and the Las Vegas bearpoppy and Las Vegas buckwheat habitat in the 26-acre parcel would not be disturbed.</p> <p>Nellis AFB will allow any approved agency to collect seeds from either the Las Vegas bearpoppy or the Las Vegas buckwheat prior to initiation of construction in the proposed Manch Manor IV area.</p> <p>Nellis AFB will coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the proposed Manch Manor IV area for transfer to the Las Vegas Springs Preserve. The salvaged topsoil will be used to assist in the creation of a habitat at the preserve for rare plants that occur in the Las Vegas Valley.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action except approximately 86 acres of native desert vegetation and Las Vegas bearpoppy and Las Vegas buckwheat habitat in proposed Manch Manor IV would not be disturbed.</p> <p>Nellis AFB will allow any approved agency to collect seeds from either the Las Vegas bearpoppy or the Las Vegas buckwheat prior to initiation of construction in the 26-acre parcel.</p> <p>Nellis AFB will coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the 26-acre parcel for transfer to the Las Vegas Springs Preserve. The salvaged topsoil will be used to assist in the creation of a habitat at the preserve for rare plants that occur in the Las Vegas Valley.</p>	<p>Impacts: Demolition and construction would not occur and there would be no impacts to biological resources.</p>

Table 2-1. Summary of Potential Environmental Impacts from the Proposed Action, Alternative 1, Alternative 2, and No-Action
Alternative
Page 13 of 13

Resource Category	Proposed Action	Alternative 1	Alternative 2	No-Action Alternative
Cultural Resources	<p>Impacts: There are no prehistoric or historic archaeological properties, historic buildings and structures, or traditional resources within the areas potentially affected by project activities.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: No project activities would occur and there would be no potential for impacts to cultural resources.</p>
Environmental Justice	<p>Impacts: Activities associated with the Proposed Action would not have a significant impact on any of the resources analyzed in the EA. Therefore, no disproportionately high and adverse human health and environmental effects on low-income and minority populations are anticipated.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: Impacts would be similar to those described under the Proposed Action.</p>	<p>Impacts: No change in environmental baseline conditions is expected.</p>

ACM	= asbestos-containing material
AOC	= Area of Concern
AST	= aboveground storage tank
CO	= carbon monoxide
dB	= decibel
DNL	= day-night average sound level
EA	= environmental assessment
EPA	= Environmental Protection Agency
ERP	= Environmental Restoration Program
HUD	= Housing and Urban Development
LBP	= lead-based paint
mg/kg	= milligrams per kilogram
MFH	= Military Family Housing
NAAQS	= National Ambient Air Quality Standards
NLR	= noise level reduction
OSHA	= Occupational Safety and Health Administration
PM10	= particulate matter equal to or less than 10 microns in diameter
PRG	= preliminary remediation goal
RCRA	= Resource Compensation and Recovery Act
SWPPP	= Storm Water Pollution Prevention Plan
USFWS	= U.S. Fish and Wildlife Service

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3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the existing environmental conditions at the Nellis Terrace, Manch Manor, and Dunning Circle housing areas at Nellis AFB. It provides information to serve as a baseline from which to identify and evaluate environmental changes resulting from renovation, demolition, and construction of MFH units at Nellis AFB. The environmental components addressed include relevant natural or human environments likely to be affected by the Proposed Action and alternatives.

Based upon the nature of the activities that would occur under the Proposed Action and alternatives, it was determined that the potential exists for the following resources to be affected or to create environmental effects: socioeconomic, land use, aesthetics, transportation, utilities, hazardous materials management, hazardous waste management, ERP sites, storage tanks, pesticide usage, ACM, LBP, radon, geology and soils, water resources, air quality, noise, biological resources, cultural resources, and environmental justice.

3.2 COMMUNITY SETTING

Nellis AFB is in southern Nevada, in Clark County, approximately 8 miles northeast of the city of Las Vegas (see Figure 1-1). Nellis AFB consists of three areas. Area I is the main part of the base containing the airfield and most of the base facilities. Area II is situated to the east of Area I and contains the weapons storage area. Area III is situated to the northwest of Area I and is separated from the remainder of the base by North Las Vegas Boulevard (see Figure 1-2). The Nellis Terrace housing area comprises approximately 164 acres on the west portion of the base, south of Las Vegas Boulevard. The Manch Manor housing area comprises approximately 275 acres on the northwest portion of the base, north of Craig Road. The Dunning Circle housing area comprises approximately 4 acres and is east of the base's main gate (see Figure 1-2).

The region of influence (ROI) to be studied will be defined for each resource area affected by the proposed project. The ROI determines the geographical area to be addressed as the Affected Environment. Although the base boundary may constitute the ROI limit for some resources, potential impacts associated with certain issues (e.g., water resources and air quality) transcend these limits.

3.2.1 Socioeconomics

The socioeconomic ROI in Clark County includes Nellis AFB and the surrounding area. Clark County had a population of 1,375,765 in 2000 (U.S. Census Bureau, 2002). The city of Las Vegas represents the largest percentage of population in the county with approximately 464,300 and is the largest city in the state of Nevada. The city of North Las Vegas had an estimated 1999 population of

109,893. Overall, Clark County is projected to experience a growth rate of approximately 19 percent from 2003 to 2010 (Clark County, 2002).

The on-base population at Nellis AFB in 2002 is 6,483 military personnel and their dependents (99th Civil Engineer Squadron, 2002b). This is a 29 percent increase from the 1996 base population of 5,032 (99th Civil Engineer Squadron, 2002b).

The economic base of the area is heavily concentrated in the tourist-related service and retail trade industries; however, construction and government jobs have become more prevalent in recent years in order to keep up with regional growth. Total employment within the Las Vegas Metropolitan Statistical Area (MSA) is approximately 834,000 (Nevada Department of Employment, Training and Rehabilitation, 2002). In June 2002, the Las Vegas MSA unemployment rate was 5.9 percent (Nevada Department of Employment, Training and Rehabilitation, 2002). Nellis AFB employed approximately 9,670 military and civilian personnel in 2001.

3.2.2 Land Use

The ROI for land use includes the existing MFH areas and adjacent areas both on and off the base.

The MFH areas consist primarily of a residential land use of single-family and duplex housing units designated as accompanied housing. An area of community service (elementary school) and outdoor recreation land use areas are situated in the center of the Nellis Terrace housing area. The proposed Manch Manor IV area is undeveloped. The existing Manch Manor housing area contains a shoppette and fire station (Figure 3-1).

The Dunning Circle housing area is surrounded by Nellis AFB property. Adjacent areas are designated as unaccompanied housing to the north and east and administrative uses to the south and west (see Figure 3-1).

Areas adjacent to the Nellis Terrace housing area include Nellis AFB property to the east and south and off-base areas to the north and west. On-base areas to the east are designated as administrative, community service, and outdoor recreation. Areas to the south are designated as outdoor recreation and open space. Off-base areas to the north and west include mixed commercial/retail and high-density residential (apartment buildings) (see Figure 3-1).

Areas adjacent to the Manch Manor housing area (including the proposed Manch Manor IV area) include Nellis AFB property to the north and northeast, and off-base property to the west, south, and east. Adjacent base property includes primarily open space and industrial areas to the north and open space, outdoor recreation, and unaccompanied housing to the east. An area of community commercial (youth center) and associated outdoor recreation areas are situated between the Manch Manor III housing and the open space of proposed Manch Manor IV. Off-base land uses include high-density residential areas to the west and east (apartment complex and mobile home park, respectively), an industrial



Figure 3-1

area to the northwest, and mixed commercial/retail and residential areas to the south (see Figure 3-1).

3.2.3 Aesthetics

Visual sensitivity is characterized in terms of high, medium, and low levels. High visual sensitivity exists in areas where views are rare, unique, or in other ways special, such as in a remote pristine environment. Medium visual sensitivity is characteristic of areas where human influence and modern civilization are evident, and the presence of motorized vehicles is commonplace. Low visual sensitivity areas tend to have minimal landscape features with little change in form, line, color, and texture.

The visual environment of the Nellis AFB MFH areas and surrounding areas are characteristic of an urban environment. These areas are mostly developed with roads, houses, and other structures, and are relatively flat with no areas of topography that offer visual interest. The undeveloped areas of the proposed Manch Manor IV do provide views of relatively undisturbed, natural desert vegetation; however, because these areas are relatively small, flat, and open, adjacent developed areas are readily visible from these areas. Therefore, they do not provide pristine views of a natural desert landscape. For these reasons, all areas within the ROI for aesthetics are considered to have a medium visual sensitivity.

3.2.4 Transportation

The ROI for the transportation analysis includes the road networks that service the MFH areas.

The existing on-base road network is a combination of streets of the same width controlled by 4-way stops oriented 90 degrees ($^{\circ}$) to the flightline. Consequently, there are intersections that meet at 45° that are controlled by single-stop signs. There is an increased accident potential at these intersections. The base transportation system has been determined to be adequate with the exception of the non-standard intersections crossing at approximately 45° (Higginbotham/Briggs & Associates, 1997).

Primary access to the Dunning Circle and Nellis Terrace housing areas are the Main Gate at Craig Road and Las Vegas Boulevard North, west of the Dunning Circle housing area, and Tyndall Gate off of Nellis Boulevard, south of the Nellis Terrace housing area (see Figure 1-2). The Manch Manor housing area can be accessed directly via two gates off Craig Road and can also be accessed on base via Stafford Drive (see Figure 2-1).

Regional access to Nellis AFB is provided by two major highway systems, Interstate (I)-15 to the east and U.S. Route 95 to the west.

3.2.5 Utilities

The utility systems discussed in this section include water, wastewater, solid waste, electricity, and natural gas. The ROI for utility systems includes the service area for each provider that serves the MFH. The major attributes of utility systems include processing, distribution, storage, and capacities and related factors, such as average daily consumption and peak demand. These factors are used to determine whether the existing utility systems are capable and adequate to provide services.

3.2.5.1 Water.

Nellis AFB obtains its potable water supply from two main sources: nine base wells and the Southern Nevada Water Authority (SNWA). A small amount of water is also purchased from the city of North Las Vegas. Recent reports indicate that the base's average daily water demand ranges from 1.6 million gallons per day (MGD) in the winter to 7.0 MGD in the summer. The majority of the increase during the summer is attributed to irrigation. Water storage consists of 7.5 million gallons within both elevated and ground storage tanks. Water distribution lines are constructed of cast iron, asbestos cement, and polyvinyl chloride (PVC) (Headquarters Air Combat Command, 2001). There are eight potable water storage tanks on the base with a total capacity of 5 million gallons (Higginbotham/Briggs and Associates, 1997).

Three of the nine base water wells are situated off base at the Water Wells Annex. Water from the Water Wells Annex is delivered to the base through 5.5 miles of transmission lines. Approximately 2 miles of transmission line was upgraded from 10-inch to 14-inch when Craig Road was widened. The remaining 3.5 miles of line is deteriorated and experiencing approximately four breaks annually (Headquarters Air Combat Command, 2001).

Three of the nine base water wells are situated off base at the Water Wells Annex. Water from the Water Wells Annex is delivered to the base through 5.5 miles of transmission lines. Approximately 2 miles of transmission line was upgraded from 10-inch to 14-inch when Craig Road was widened. The remaining 3.5 miles of line is deteriorated and experiencing approximately four breaks annually (Headquarters Air Combat Command, 2001).

3.2.5.2 Wastewater.

Wastewater from Nellis AFB is discharged to the Clark County Sanitation District (CCSD) for treatment at the wastewater treatment plant. The wastewater system on base, including the housing areas, includes 382,000 linear feet (LF) of gravity sewer mains and 12 sewage pumping stations. Piping consists of vitrified clay, concrete, and PVC (Headquarters Air Combat Command, 2001). The base discharges 1.5 MGD of wastewater to the CCSD. Domestic wastewater accounts for 90 to 95 percent of the total discharge from the base. Wastewater from most of the base is discharged to a CCSD line on Nellis Boulevard at Cheyenne Road (Higginbotham/Briggs and Associates, 1997). There are no wastewater pumping stations within the MFH areas.

3.2.5.3 Electricity.

The electrical distribution system at Nellis AFB consists of nine 12.47/7.2-kilovolt (kV) feeders. These feeders are supplied from a base-owned substation, which is itself supplied from a single 69-kV Nevada Power Company incoming primary feed (Headquarters Air Combat Command, 2001). The power is drawn from the Hoover Dam power grid. The base's substation is adjacent to the North Gate at Las Vegas Boulevard. Power is distributed throughout the base via 545,000 LF of overhead cables and 441,000 LF of underground cables. The 69 kV primary power is transformed to 12.47 kV by two 33-megawatt (MW) transformers (Higginbotham/Briggs and Associates, 1997).

Nellis AFB has met the criteria established by the Air Force as being "PCB-free" (Headquarters Air Combat Command, 1998). However, equipment that contains PCBs may still be present within the installation. Transformers and electrical equipment with PCB concentrations of less than 50 ppm may be present on base.

The electrical distribution system in the MFH housing areas is both overhead and underground. The electrical distribution system on base is owned by the Air Force with the exception of the overhead portion of the system within Old Nellis Terrace, which is owned by the Nevada Power Company.

3.2.5.4 Natural Gas.

Natural gas is provided to Nellis AFB by Southwest Gas Company via a high pressure transmission line at five locations along North Las Vegas Boulevard (State Highway 604). Lines enter the base just north of the Nellis Terrace housing area, along Craig Road at the southeast end of the Manch Manor housing area, and at three locations between the Main Gate and North Gate entrances to the base. There are three metering stations near the housing areas: one station at the entrance to the base north of the Nellis Terrace housing area, one station at the entrance near the Manch Manor housing area, and one station just southwest of the North Gate. The main base has approximately 20 miles of gas mains/laterals lines. The housing areas have approximately 19.3 miles of gas lines. The gas distribution system on the main base and in the housing areas is owned and operated by the Air Force. All of the gas lines on the main base and the housing areas are comprised of polyethylene lines (Headquarters Air Combat Command, 2001).

3.2.5.5 Solid Waste.

Solid waste collection and disposal services in the city of North Las Vegas and at Nellis AFB are handled by a private contractor. In addition to municipal waste collection, curb-side pick-up for recyclables, consisting of cardboard, paper, glass, plastics, and aluminum is also provided. There are recycling points throughout Nellis AFB where the contractor collects recyclables from administrative facilities. Municipal solid waste is disposed of at the Apex Regional Landfill, situated 18 miles northeast of Las Vegas, in the Garnet Valley. The facility is a Class I landfill permitted by the Nevada Division of Environmental Protection and is operated by Silver State Disposal Services Inc. The 1,202-acre

landfill, which opened in 1993, was designed with a refuse capacity of approximately 784 million cubic yards and a service life of 85 years. It currently processes approximately 6,940 tons per day of municipal solid waste (Nevada Department of Environmental Protection, 2002).

3.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Occupational Safety and Health Act, and the Emergency Planning and Community Right-to-Know Act. Hazardous materials have been defined in Air Force Instruction (AFI) 32-7086, Hazardous Materials Management, to include any substance with special characteristics that could harm people, plants, or animals when released.

Hazardous waste is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitability, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR 261.

The ROI for hazardous materials and hazardous waste encompasses those areas that could potentially be exposed to a release during renovation, demolition and construction activities associated with the MFH areas.

3.3.1 Hazardous Materials Management

Nellis Air Force Base Plan 19-1, Facility Response Plan, incorporates the emergency response requirements of the Clean Water Act (CWA), as amended by the Oil Pollution Act of 1990, the Clean Air Act (CAA), and RCRA into a single document that is formatted as the U.S. EPA's model facility response plan. It also provides emergency response guidance mandated by the OSHA. This plan complies with AFI 32-4002, Hazardous Material Emergency and Response Planning Program. The plan describes the spill prevention, control, and countermeasure procedures implemented at Nellis AFB and the contingency plan for releases (Nellis Air Force Base, 1999).

Small quantities of hazardous substances are stored in Building 3366 (fire station) and Building 3362 (shoppette) (see Figure 2-2). With the exception of small quantities of household hazardous materials (e.g., paints, thinners, household cleaners) stored by residents within the housing units, these are the only buildings within the housing areas that store hazardous materials. Only small quantities of household hazardous materials are stored in the fire station. These include glass cleaner, chrome polish, and gasoline (for use in a lawn mower). Hazardous materials stored within the shoppette included janitorial cleaning supplies, motor oil, and cleaning supplies; these materials are among the goods available for sale to residents.

3.3.2 Hazardous Waste Management

Procedures for management of hazardous waste generated at Nellis AFB are described in Nellis Air Force Base Plan 12, Hazardous Waste Management Plan (Nellis Air Force Base, 2000a). Hazardous waste is collected at initial accumulation points (IAPs) throughout the base. Waste is then transferred to the 90-day Central Accumulation Site (CAS) in Building 853. Environmental Flight manages the 90-day CAS under RCRA Part B permit standards. The Defense Reutilization and Marketing Office (DRMO) issues a contract delivery order, and a permitted waste contractor determines the appropriate treatment and disposal options and arranges for a licensed transporter to pick up the waste and transport it to a final off-base disposal site (Nellis Air Force Base, 2000a).

No hazardous waste is stored within the housing areas. Small quantities of household hazardous waste may be generated by residents, the shoppette, and the fire station; however, quantities of waste are minimal, and hazardous waste restrictions and regulations for storage and disposal do not apply to households.

3.3.3 Environmental Restoration Program Sites/Areas of Concern

The Installation Restoration Program (IRP) was established to identify, characterize, and remediate CERCLA-related contamination on Air Force installations. The program was designed to evaluate past disposal sites, control the migration of contaminants, and control potential hazards to human health and the environment. IRP activities were initiated at Nellis AFB in 1982 (Nellis Air Force Base, 2000b). In 2001, a name change for the program has been directed. The IRP is now referred to as the ERP, based upon terminology used in AFI 32-7020, *Environmental Restoration Program*, dated February 7, 2001. The term ERP is used throughout this document when discussing the program.

There are no active or closed ERP sites or areas of concern (AOCs) within any of the existing MFH areas or undeveloped areas proposed for development as part of the MFH Revitalization Project.

3.3.4 Storage Tanks

The U.S. EPA has issued federal regulations related to USTs in 40 CFR Parts 280 and 112. Aboveground storage tanks (ASTs) are subject to regulation under the CWA (33 U.S.C. Sections 1251-1578) and the Oil Pollution Act (specifically, 40 CFR Part 112). The operation and construction of ASTs is subject to National Fire Protection Association fire codes and the Uniform Fire Code.

Nellis AFB Plan 16, Aboveground Storage Tanks Management Plan (Headquarters Air Warfare Center, 1999) provides guidance and assigns responsibility for managing ASTs in accordance with AFI 32-7044, *Storage Tank Compliance*. The base also maintains a Facility Response Plan which establishes responsibilities and provides prevention guidelines, as well as contingency plans, for use in the event of a release.

There are no USTs within any of the housing area properties. One AST is situated within the Manch Manor housing area. The AST is situated outside Building 3366 (fire station) in the northwest portion of the Manch Manor housing area (see Figure 2-2). This AST is a 25-gallon day tank that stores diesel fuel for an emergency generator.

3.3.5 Pesticide Usage

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. Sections 136-136y) regulates the registration and use of pesticides. Pesticide management activities are subject to federal regulations contained in 40 CFR Parts 162, 165, 166, 170, and 171. The pest management program at Nellis AFB utilizes an integrated surveillance and control effort based on the Air Combat Command (ACC) implementation of the FIFRA, as amended, as implemented by DoD Instruction 4150.7 *DoD Pest Management Program*, and AFI 32-1053, *Pest Management Program*. Pest management procedures are addressed in the *Pest Management Plan* (Nellis Air Force Base, 2000c). The pest management program, as described in the plan, is reviewed annually.

Pest management is the responsibility of the Pest Management Section personnel. Pest management personnel adhere to the pesticide label directions when handling all pesticides. The Pest Management Section provides treatment for all base buildings and housing areas. Pest Management personnel maintain and monitor files of building and home treatments, including chemicals issued by the Facilities Improvement Center, which dispenses pest control supplies to residents through a self-help program.

Herbicides, insecticides, and other pesticides are used on the base to control pest populations. Pest management programs include measures to control health-related pests (e.g., mosquitoes, ticks and fleas, bees and wasps, scorpions, spiders, venomous snakes, lice, mites, and chiggers); structural pests (e.g., termites and powder post beetles); general household/nuisance pests (e.g., ants, cockroaches, and flies); weed pests (e.g., mixed vegetation, turf diseases, and weeds); vertebrate pests (e.g., bats, rodents, gophers, feral animals, coyotes, and foxes); and bird pests (e.g., pigeons).

Entomology shop records indicate that chlordane was applied in the MFH areas between 1985 and 1988. Records of usage prior to 1985 are not available.

Chlordane was applied to the soil around building foundations to control termites. All uses of chlordane were banned by the U.S. EPA in 1988; however, chlordane is a persistent bioaccumulative and toxic chemical. A soil sampling and analysis program for the presence of pesticides was conducted in August 2002. A total of 22 samples were collected: 2 in the Dunning Circle housing area and 10 each in the Manch Manor and Nellis Terrace housing areas. The pesticides chlordane, dichlorodiphenyl dichloroethane (DDD), dichlorodiphenyl dichloroethylene (DDE), dichlorodiphenyl trichloroethane (DDT), endrin, dieldrin, and heptachlor were detected; however, chlordane was the only pesticide detected in every sample. Of the pesticides detected, only chlordane, DDE, dieldrin, and heptachlor were detected in concentrations exceeding U.S. EPA Region IX residential preliminary

remediation goals (PRGs) for soil. An exceedence of the PRG for dieldrin (0.03 milligrams per kilogram [mg/kg]) was detected in one of the two soil samples collected from the Dunning Circle housing area where dieldrin was detected at 0.04 mg/kg. In the samples collected from the Manch Manor housing area, chlordane concentrations in three samples (3.0, 4.1, and 5.3 mg/kg) exceeded the PRG of 1.6 mg/kg and DDE in one sample (3.3 mg/kg) exceeded the PRG of 1.7 mg/kg. In samples collected from the Nellis Terrace housing area, chlordane concentrations exceeded the PRG in five samples (1.7, 1.8, 260, 460, and 580 mg/kg) and in one sample each, heptachlor and heptachlor epoxide concentrations (0.4 mg/kg and 1.3 mg/kg, respectively) exceeded their respective PRGs of 0.11 mg/kg and 0.053 mg/kg.

3.3.6 Asbestos-Containing Material

ACM and ACM abatement are regulated by the U.S. EPA and OSHA. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the CAA, which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). Under NESHAP, the owner of a structure must, prior to demolition or renovation of buildings with ACM, provide notice to the regulator with CAA authority (either the U.S. EPA or its state counterpart). The NESHAP regulations (40 CFR Part 61, Subpart M) address the demolition or renovation of buildings with ACM. The Asbestos Hazard Emergency Response Act (AHERA), Public Law (P.L.) 99-519 and P.L. 101-637, addresses worker protection for employees who work around or remediate ACM.

Renovation or demolition of buildings with ACM can release asbestos fibers into the air. The current Air Force practice is to manage or abate ACM in active facilities and abate any ACM that has been identified as a hazard to human health, following regulatory requirements and prior to facility demolition or renovation. Removal of ACM occurs when there is a potential for asbestos fiber release that would affect human health or the environment.

An asbestos survey conducted at Nellis AFB in 1993, identified asbestos in the MFH units. The study sampled housing units in the Nellis Terrace housing area and all 3 areas within the Manch Manor housing area that were scheduled for renovation (a total of 90 units). ACM identified by the survey included floor tiles, vinyl sheeting, black mastic under floor tiles, sprayed-on “popcorn” ceiling material, roofing materials, condensate control material situated under kitchen sinks, black tar wrap on heating, ventilation, air conditioning lines, and weatherproofing/sealant situated where carports and houses meet (Dynamic Corporation, 1993). In 1994, an ACM survey of one of each housing type found on Nellis AFB (a total of 37 units) identified ACM in floor tiles, sheet linoleum flooring, textured acoustical ceiling material, sheetrock joint compound, wall coating, pipe insulation, mechanical equipment insulation, transite, and roofing materials (Galson Corporation, 1994). Source documents for ACM surveys did not contain facility-specific sampling results; therefore, the specific types of ACM identified within each structure is not available.

Asbestos testing conducted in 1998 on 16 housing units in Manch Manor II identified ACM in the sealant used on exterior stucco and block walls

(Confidential Compliance Consultants, 1998). Asbestos cement piping has also been identified in the water distribution system.

3.3.7 Lead-Based Paint

Human exposure to lead has been determined to pose an adverse health risk by agencies such as OSHA and the U.S. EPA. Sources of exposure to lead are dust, soils, and paint. In 1973, the Consumer Product Safety Commission (CPSC) established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint. In 1978, under the Consumer Product Safety Act (P.L. 101-608, as implemented by 16 CFR Part 1303), the CPSC lowered the allowable lead level in paint to 0.06 percent. The Act also restricted the use of LBP in nonindustrial facilities. DoD implemented a ban of LBP use in 1978; therefore, it is possible that facilities constructed prior to or during 1978 may contain LBP. The Air Force does not actively pursue removal of LBP. Instead, it is managed in place and removed by the Air Force, as necessary.

A LBP survey conducted at Nellis AFB in 1993, identified LBP in the MFH units. The study sampled housing units in both the Nellis Terrace and Manch Manor housing areas that were scheduled for renovation (a total of 90 units). LBP identified by the survey included exterior trim, exterior walls, and playground equipment (Dynamic Corporation, 1993). An LBP survey of MFH units and the child care center and youth center was conducted in 1994. A total of 168 housing units were included in the survey. These included 4 units within Dunning Circle, 108 units in Manch Manor, and 56 units in Nellis Terrace. The survey found that approximately 67 percent of the housing units tested positive for LBP in at least one surveyed component. Components that tested positive include sheetrock ceilings, wood door frames, exterior wood doors and jambs, interior wood door jambs, thresholds, concrete facades, exterior wood soffits, exterior wood trim, exterior block windowsills, wood shelves and supports, block walls, and sheetrock walls (Galson Corporation, 1994).

LBP was found in all units tested in Manch Manor I and II, but was found on only one unit in Manch Manor III. Sheetrock ceilings, wood door frames, exterior wood doors and jambs, interior wood doors, concrete facades, wood fencing and facades, exterior soffits, railings, exterior trim, and exterior wood window frames were all found to contain LBP in surveyed housing units in Manch Manor I. In Manch Manor II, thresholds, exterior metal trim, exterior block windowsills, block walls, and ceiling were found to contain LBP. A wood baseboard on one unit was the only item found to contain LBP in Manch Manor III (Galson Corporation, 1994).

Within Dunning Circle, LBP was identified on Buildings 644, 645, 647, and 650. No LBP was detected on Building 646. Components that tested positive included exterior wood trim on Building 644, shelves in the living room of Building 645, sheetrock walls in the kitchen in Building 647, and wood soffits and the wood ceiling of the garage at Building 650 (Galson, 1994).

An LBP survey was conducted in 1996 on 16 units within Manch Manor I. LBP was identified in all units surveyed. LBP was found on fascia boards, eves,

rafters, carport components, carport privacy fences, and wood windowsill components. Soil samples were also taken at each unit surveyed and were tested for the presence of lead from LBP. Lead levels in all soil samples were well below the U.S. Department of Housing and Urban Development (HUD) level of concern of 400 ppm (Confidential Compliance Consultants, 1996). In 1998, an additional LBP survey was conducted on 16 units in Manch Manor II and on 51 units in Old Nellis Terrace. LBP was found in all units tested in Manch Manor II. LBP was found on fascia and other various wood components, steel carport components, and exterior wall surfaces. LBP was identified on all units surveyed in Old Nellis Terrace. Components found to contain LBP included carport posts, ceilings, rafters, doors and door components, fascias, rafters, stucco and wooden walls, and window components, although not all these components in each unit contained LBP. No additional soil samples were tested for the presence of lead from LBP because results of soil sampling that had been conducted in Manch Manor I in 1996 indicated that lead levels in all soil samples were well below the HUD level of concern of 400 ppm (Confidential Compliance Consultants, 1998).

Based on the results of the surveys, all housing units within Old Nellis Terrace, and virtually every housing unit in Dunning Circle and Manch Manor I and II, are expected to contain LBP. However, houses in New Nellis Terrace and the 13 senior officers housing units in Manch Manor II were constructed after the DoD ban on use of LBP in 1978 and are not expected to contain LBP.

3.3.8 Radon

Radon is a naturally occurring, colorless, and odorless radioactive gas that is produced by radioactive decay of naturally occurring uranium. Radon that is present in soil can enter a building through small spaces and openings, accumulating in enclosed areas such as basements. There are currently no federal or state standards regulating radon exposure. The U.S. EPA offers a pamphlet, A Citizen's Guide to Radon (U.S. Environmental Protection Agency, 1992), which offers advice to persons concerned with radon in their homes.

Air Force policy requires implementation of the Air Force Radon Assessment and Mitigation Program (RAMP) to determine levels of radon exposure on military personnel and their dependents. The U.S. EPA recommends implementing methods to reduce radon levels in homes where levels are 4 picocuries per liter (pCi/l) or higher.

The U.S. EPA has prepared a map of radon zones for the United States that assigns each county to one of three zones based on radon potential. Predicted indoor radon levels are highest in Zone 1 and lowest in Zone 3. Clark County, Nevada, is designated as a Zone 3 county. Predicted average indoor radon levels in Zone 3 areas are less than 2 pCi/l. However radon potential within a county can vary (U.S. Environmental Protection Agency, 2002).

The RAMP initial screening was performed in 1987/1988. Preliminary sampling was conducted at randomly selected MFH units, dormitories, and child care centers. Only two MFH units in the Nellis Terrace housing area exceeded the Air

Force-recommended action level of 3.5 pCi/l. Based on the results of this initial screening, it was determined that Nellis AFB was a “medium-risk” installation for the occurrence of radon. Based on these initial screening results, Nellis AFB conducted a detailed assessment in 1990/1991. A total of 23 units with radon levels above the statistically adjusted threshold value of 3.3 pCi/l were identified in both the Nellis Terrace and Manch Manor housing areas. These housing units with elevated radon readings were abated and resampled in 1993/1994. For all but two units, the mitigation was successful in reducing radon levels to less than 4 pCi/l (Department of the Air Force, 1994).

3.4 NATURAL ENVIRONMENT

Aspects of the natural environment discussed in this EA include geology and soils, water resources, air quality, noise, biological resources, and cultural resources.

3.4.1 Geology and Soils

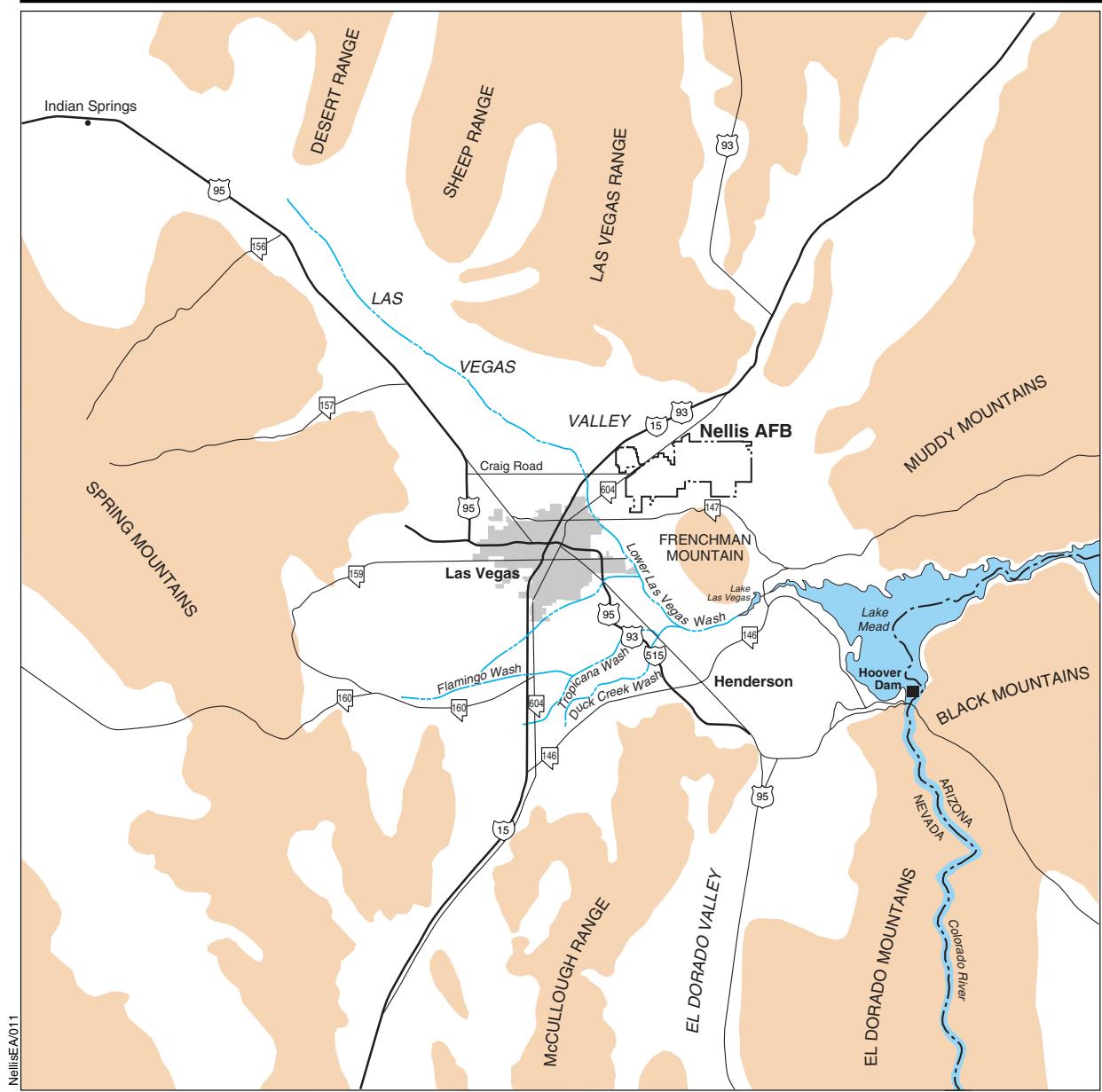
This discussion of geology and soils covers features of the physical environment that may be affected by the proposed activities. These include topography/physiography, geology (including units and structure), the potential for natural hazards, and soils (types and properties). The ROI considered for geology is the regional setting surrounding the base as well as specific localized features on, or proximal to, the MFH areas.

3.4.1.1 Topography.

Regional Setting. Nellis AFB is situated in the Basin and Range physiographic province, which is characterized by recent fault movement (since the Oligocene, within the last 33 million years) forming numerous elongated mountain ranges separated by similarly shaped valleys (basins). Much of the drainage within this province is interior, so playa formation is common. The difference in elevations between mountaintops and adjacent valley bottoms is generally no more than 3,000 to 5,000 feet (Hunt, 1974).

The local setting includes the Las Vegas Valley, which is a somewhat pear-shaped feature, with a valley that runs northwest to southeast. The valley ends just beyond the city of Henderson (about 10 miles west of Hoover Dam). This broad portion of the valley is also known locally as the Las Vegas Basin. Nellis AFB is situated within the Las Vegas Basin portion of the Las Vegas Valley.

The topography is characterized primarily by flat alluvial deposits within the valley surrounded by numerous mountains and ranges in all directions. To the north (the Desert, Sheep, and Las Vegas ranges) and east (the Black, Frenchman, and Muddy mountains) they are generally north-south trending ranges. To the west (Spring Mountains) and south (El Dorado Mountains and McCullough Range) the mountains are less linear and not as consistently aligned. The physiography of the Las Vegas area is shown on Figure 3-2.



EXPLANATION

— — — Nellis Boundary
— — — State Boundary
 Water
 Mountain Range



Physiography of the Las Vegas Area

Figure 3-2

Most of Nellis AFB is relatively flat. Over much of the base, slopes are one percent or less (U.S. Air Force, 1999). Elevations range to nearly 2,500 feet above mean sea level (MSL) in the foothills within the east portion of Area II (Higgenbotham/Briggs and Associates, 1997). Within Areas I and III, elevations range from approximately 1,980 feet above MSL at the northwest corner of the base in Area III to approximately 1,800 feet above MSL in the southernmost part of the base in Area I over a distance of approximately 3.5 miles (U.S. Geological Survey, 1973).

3.4.1.2 Geology.

Two primary types of bedrock geology underlie the mountains surrounding the Las Vegas Valley. These are either older sedimentary rocks (from the Paleozoic Era) or younger igneous rocks, which include both volcanic and, to a lesser extent, plutonic rocks (all from the early Cenozoic Era). The sedimentary rocks are predominantly carbonates (limestone and dolomite), although there are also clastic formations (sandstone and shale) and some quartzite. The mountains to the west (Spring Mountains), north (Desert, Sheep, and Las Vegas ranges), and east (Frenchman and Muddy mountains) are comprised of these sedimentary rock formations. The igneous rocks primarily include basalts and other undifferentiated volcanic rocks, and smaller occurrences of intrusive rocks (granite, quartz monzonite, granodiorite, rhyolite, and other undifferentiated rock types). Mountains to the south (McCullough Range and El Dorado Mountains) and east (Black Mountains) of the valley are comprised of volcanic rocks, while the plutonic rocks also are exposed at a number of locations in the southern mountains (Longwell, et al., 1965).

The Las Vegas Valley is structural in origin and has a considerable accumulation of Quaternary alluvium derived from the surrounding mountains and transported to the valley. Coarse material has been deposited closest to the mountain fronts in alluvial fans, while the finer particles have reached the valley bottoms where they were deposited in alluvial flood plain and lacustrine environments (Longwell, et al., 1965; Nellis Air Force Base, 2001). The Spring Mountains are the dominant source of detritus to the valley fill sediments in the Las Vegas Valley. The alluvial sediments generally become finer grained from west to east within the valley. These valley fill deposits are estimated to range from 2,000 to 5,000 feet thick beneath Nellis AFB (Black and Veatch, 2001).

3.4.1.3 Natural Hazards.

Nellis AFB is situated in Seismic Hazard Zone 2B (International Conference of Building Officials, 1997). Potential earthquakes in this zone have been correlated to a Modified Mercalli intensity (MMI) level value of VII (Lindeburg and Baradar, 2001). Thus, areas designated in Seismic Hazard Zone 2B could experience earthquakes with intensities of MMI Level VII. Typical results of a Level VII earthquake, considered to have strong shaking severity, have been described as follows (Louie, 1996):

People have difficulty standing. Drivers feel their cars shaking.
Some furniture breaks. Loose bricks fall from buildings.

Damage is slight to moderate in well-built buildings;
considerable in poorly built buildings.

3.4.1.4 Soils.

The U.S. Department of Agriculture (USDA) has mapped the soils of the west (developed) portion Nellis AFB (Table 3-1). The USDA soil survey provides both a general soil map for the entire county and also detailed soil maps for most of the county at a larger scale (U.S. Department of Agriculture, 1985). The general map combines multiple soil types and distinguishes between different map units based on soils, relief, and drainage. In this system, soils underlying the areas of Nellis AFB (Areas I and III) fall into two distinct soil map units. These are the Cave-Las Vegas-Goodspring map unit, and Glencarb map unit. The Cave-Las Vegas-Goodspring map unit consists of shallow to very shallow soils on alluvial remnants. They are found in most of Area III and in the north part of Area I. The Glencarb map unit consists of very deep soils on floodplains and alluvial flats. They are found on the south and southeast part of Area I and the southwest corner of Area III. The detailed soil map units are described below.

Table 3-1. Soil Properties and Use Capabilities, Nellis AFB

Soil Type	Slope (percent)	Building site restrictions	Permeability (in/hr) ^(a)	Shrink/Swell Potential ^(a)	Corrosion risk to uncoated steel/concrete ^(a)	Depth to cemented pan (in)	Drainage	Erosion Factor ^{(a)(b)} / Wind Erodibility Group ^(c)
Glencarb	0-2	Severe: Flooding Moderate: Low strength and shrink-swell	0.2-2.0	Low to moderate	High/Moderate	NA	Well drained	0.55/1
Las Vegas	0-4	Severe: flooding, cemented pan	0.2-6.0	Low to moderate	High/High	3-14	Well drained	0.20-0.32/4
McCarren	0-4	Severe: flooding, excess gypsum	2.0-6.0	Low	High/High	NA	Well drained	0.28/5
Destazo	0-2	Severe: flooding, shrink-swell	0.2-6.0	Low to moderate	High/High	NA	Well drained	0.17-0.24/3
Skyhaven	0-4	Severe: flooding, cemented pan, shrink-swell	0.2-2.0	Low to moderate	High/High	24-40	Well drained	0.17-0.32/3
Grapevine	0-4	Severe: flooding	0.6-2.0	Low	High/High	NA	Well drained	0.32-0.43/5
Urban	NA	NA	NA	NA	NA	NA	NA	NA

Notes: (a) Includes the range of the attribute at different depths in the soil.

(b) Erosion factor is a measure of the susceptibility of a soil to sheet and rill erosion by water. The higher the value the more susceptible the soil is to erosion by water. In the Las Vegas area these values range from 0.02 to 0.55.

(c) Wind erodibility is measure of the susceptibility of a soil to wind erosion. Soils are placed into eight groups with Group 1 being extremely erodible and Group 8 being not subject to wind erosion.

in/hr = inch per hour

NA = not applicable

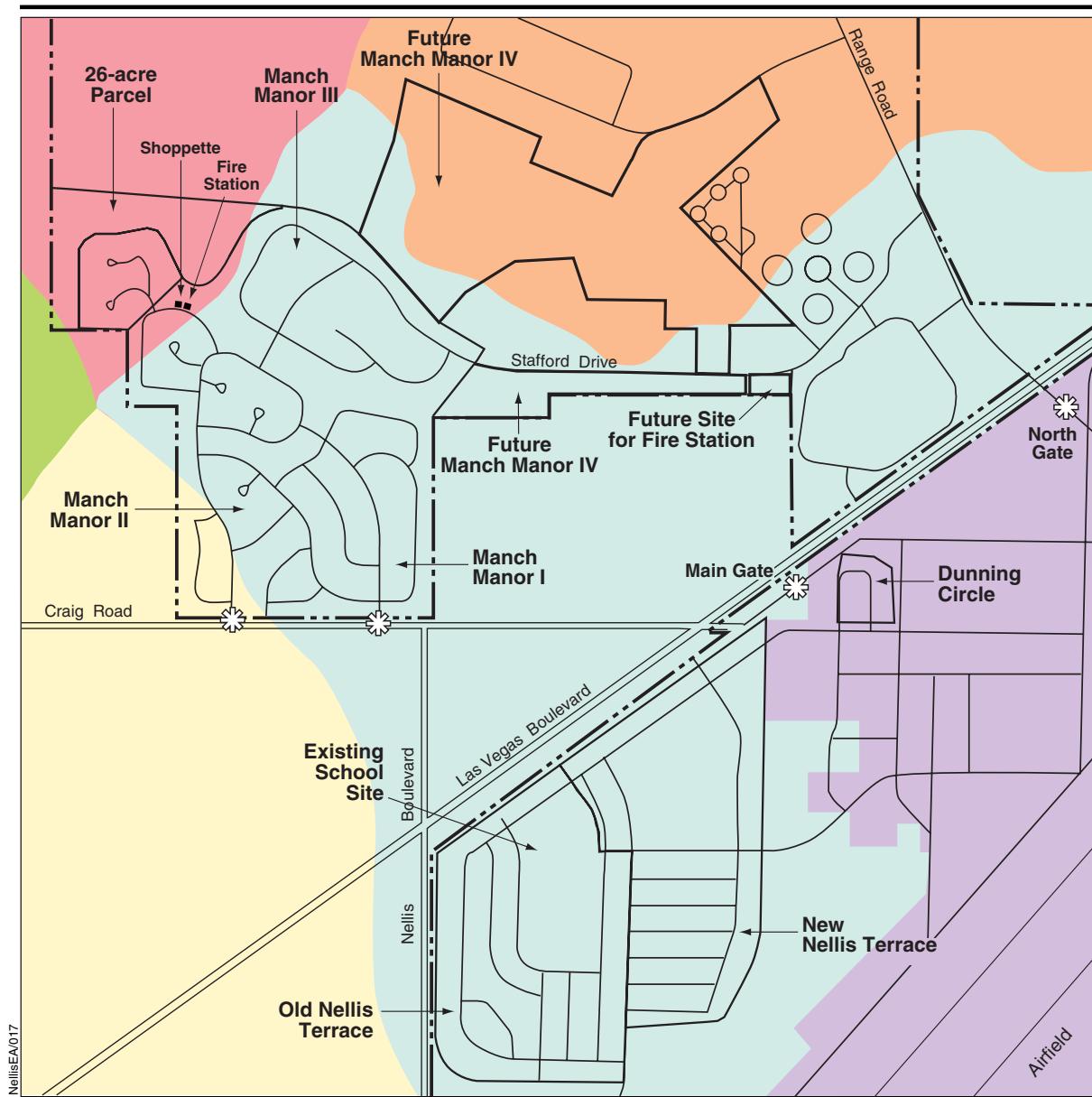
Source: U.S. Department of Agriculture, 1985.

Dunning Circle Housing Area. Due to the highly developed nature of this area, the soils in the Dunning Circle housing area are mapped as Urban Land, which is defined as areas covered by asphalt, concrete, and buildings or other structures (U.S. Department of Agriculture, 1985). However, the area is completely surrounded by Las Vegas-Destazo complex, 0 to 2 percent slopes, and therefore this type of soil is likely to underlie the urban coverings in this area (Figure 3-3). The Las Vegas-Destazo complex is comprised of intermingled soils consisting of the following series: Las Vegas gravelly fine sandy loam (60 percent), Destazo fine sandy loam (25 percent), and other soils (15 percent). The Las Vegas soil is shallow and the Destazo soil is very deep. Both soils are well drained and are formed in alluvium derived dominantly from limestone, dolomite, and sediment with a high lime content. An indurated, lime-cemented hardpan at a depth of 3 to 14 inches occurs in the Las Vegas soil. Both have a moderately slow permeability. Available water capacity is low in Las Vegas soil and moderate in Destazo soil. For both soils, runoff is slow, and the hazard of water erosion is slight, but the hazard of blowing soil is high. Primary limitations of these soils for construction are the hazard of flooding and limited depth to hardpan in the Las Vegas soil series. Both soils are subject to rare periods of flooding from prolonged, high-intensity storms.

Manch Manor Housing Area. Soils in the Manch Manor area are mapped as Glencarb silt loam, Las-Vegas-Destazo complex, 0 to 2 percent slopes; Las Vegas-McCarren-Grapevine complex, 0 to 4 percent slopes; and Las Vegas-Skyhaven complex, 0 to 4 percent slopes. The primary soil unit in the Manch Manor housing area is the Las Vegas-Destazo complex, 0 to 2 percent slopes, which is described above for the Dunning Circle housing area (see Figure 3-3).

Glencarb silt loam is found in the southwest corner of Manch Manor II. This is a very deep, well-drained soil on recent alluvial flats. It is formed in alluvium derived from various kinds of rocks. Permeability is moderately slow; available water capacity is high. Runoff is slow, and the hazard of water erosion is slight, but the hazard of blowing soil is high. The main limitation of this soil for construction is the hazard for flooding; it is subject to rare periods of flooding from prolonged, high-intensity storms.

The Las Vegas-McCarren-Grapevine complex, 0 to 4 percent slopes, is found in the northwest corner of Manch Manor II. This complex consists of intermingled Las Vegas fine gravelly loam (40 percent), McCarren fine sandy loam (25 percent), Grapevine very fine sandy loam (20 percent), and other soils (15 percent). The Las Vegas soil was described above under the Las Vegas-Destazo complex. The McCarren soil formed in alluvium derived from limestone, sandstone, and gypsiferous sediment. The Grapevine soil formed in alluvium derived from different types of rocks that have a high content of gypsiferous material. Both the McCarren and Grapevine soils are very deep and well drained. Permeability is moderate in Grapevine soil and moderately slow in McCarren soil. Available water capacity is moderate in McCarren soil and high in Grapevine soil. For both soils, runoff is slow, and the hazard of water erosion is slight, but the hazard of blowing soil is high. Both soils are subject to rare periods of flooding from prolonged, high-intensity storms. Primary limitations of the soils in this complex for construction are the hazard of flooding and limited depth to hardpan



EXPLANATION

- Base Boundary
- Entrance Gate
- Las Vegas-Destazo Complex
- Glencarb Silt Loam
- Urban Land
- Las Vegas-McCarran-Grapevine Complex



Soils Map

Figure 3-3

in the Las Vegas soil. Gypsum in the McCarren and Grapevine soils can corrode concrete, and excessive irrigation can dissolve gypsum in the soil resulting in subsidence.

The Las Vegas-Skyhaven complex, 0 to 4 percent slopes, is found in the currently undeveloped portion of the Manch Manor housing area referred to as Manch Manor IV. This complex consists of intermingled Las Vegas fine gravelly loam (60 percent), Skyhaven very fine sandy loam (30 percent), and Weiser soils (10 percent). The Las Vegas soil was described above under the Las Vegas-Destazo complex. The Skyhaven soil formed in alluvium derived dominantly from limestone, dolomite, and other rock that has a high content of lime. It is moderately deep and well drained. Permeability is moderately slow, and available water capacity is moderate. Runoff is slow, and the hazard of water erosion is slight, but the hazard of blowing soil is high. An indurated lime-cemented hardpan is found at a depth of 24 to 40 inches. The soil is subject to rare periods of flooding from prolonged, high-intensity storms. Primary limitations of the soils in this complex for construction are the hazard of flooding and limited depth to hardpan in the Las Vegas soil. Gypsum in the Skyhaven soil can corrode concrete.

Nellis Terrace Housing Area. The entire Nellis Terrace housing area is mapped as Las Vegas-Destazo complex, 0 to 2 percent slopes (U.S. Department of Agriculture, 1985) (see Figure 3-3). This soil is described above for the Dunning Circle housing area.

3.4.2 Water Resources

The following subsections describe the existing environment as it relates to surface water and groundwater. The ROI for water resources encompasses the housing areas, as well as the surface and groundwater features that proposed activities within these areas have the potential to affect.

3.4.2.1 Surface Water.

Surface water in the Las Vegas Valley drains to the Las Vegas Wash, which is the primary water course in the area and eventually makes its way to the Colorado River.

Surface water drainage on base, within the Nellis Terrace, Manch Manor, and Dunning Circle housing areas, flows to Clark County Regional Flood Control District channels to the southeast where it is routed into the Las Vegas Wash. Municipal sewage from these areas is treated by the CCSD in a modern facility and then released into the Las Vegas Wash southeast of the Valley. The Las Vegas Wash historically connected directly to the Colorado River, but today it is channeled underneath Lake Las Vegas near the Lake Mead National Recreation Area, which is the center of a private home and golf course development. On the far side of the Lake Las Vegas development, the Wash comes back to the surface from beneath the lake and flows only about 1 kilometer to its discharge point into Lake Mead (Nellis Air Force Base, 2001).

According to reports, a portion of the Manch Manor II area has experienced incidents of flooding in the past. Some episodes of heavy precipitation have produced a surface water flow beyond that which the existing surface water drainage controls can accommodate. As a result, some MFH units within Manch Manor II have flooded (99th Civil Engineering Squadron, 2001).

Nellis AFB has been included under the Nevada General Discharge Permit for Storm Water Discharges Associated With Industrial Activity (the Nevada form of the Storm Water National Pollutant Discharge Elimination System [NPDES] permit). Under this permit, the base is required to prepare and periodically update a Storm Water Pollution Prevention Plan (SWPPP) that describes how structural and nonstructural best management practices (BMPs) will be used to help minimize the potential for discharge of contaminants to surface water bodies and, therefore, help to protect water quality (Montgomery Watson, 2001).

3.4.2.2 Groundwater.

As noted in the discussion of physiography, Nellis AFB is situated on the eastern side of Las Vegas Valley. Although this is a structurally formed basin, the Las Vegas Valley is filled with a considerable volume of alluvial sediments. This sediment volume and thickness has allowed a substantial groundwater reservoir (aquifer) to accumulate, which has historically provided a significant portion of the water supply for the city of Las Vegas and the surrounding communities (Longwell, et al., 1965). Groundwater currently accounts for about 29 percent of the water supply for Nellis AFB (Nellis Air Force Base, 2001).

The primary water supply aquifer is situated at depths of at least 100 feet below ground surface (bgs) and increases to more than 120 feet bgs. The gradient of the upper surface of the primary aquifer (the water table) generally slopes downward toward the east; the groundwater flow within Las Vegas Valley is generally from west to east. The nature of the current climate (arid) and the composition of the underlying sediments (from carbonate rock sources) combine to promote the formation of a shallow hardpan layer within depths of up to 20 feet bgs. This commonly results in the establishment of perched aquifers, especially where artificial sources of water are allowed to seep into the ground. Thus, at Nellis AFB, shallow, perched aquifers have formed and generally collect the contamination that finds its way into the ground.

The deeper aquifers at Nellis AFB are not known to have been impacted by contaminants identified in shallow groundwater. Laboratory analyses of samples from six Nellis AFB production wells detected no contamination by volatile organic compounds (VOCs) or nitrates. The contaminants in the shallow groundwater are being removed by a remediation system (Nellis Air Force Base, 2001).

3.4.3 Air Quality

Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. The ROI for air quality includes Clark County, Nevada.

The federal CAA, 42 U.S.C. 7401-7671(q), amended in November 1990, stipulates that emissions sources must comply with the air quality standards and regulations that have been established by federal, state, and county regulatory agencies. These standards and regulations focus on (1) the maximum allowable ambient pollutant concentrations, and (2) the maximum allowable emissions from individual sources.

U.S. EPA established the federal standards for the permissible levels of certain pollutants in the atmosphere. The National Ambient Air Quality Standards (NAAQS) have been established for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone, sulfur dioxide (SO₂), lead (Pb), and particulate matter equal to or less than 10 microns in diameter (PM₁₀). Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors. The concentration of ozone is not determined by direct measurement, but by the measurement of the precursors, nitrogen oxides (NO_x) and VOCs. The national and state ambient air quality standards are listed in Table 3-2.

The U.S. EPA designates all areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Pollutants in an area may be designated as unclassified when there are insufficient ambient air quality data for the U.S. EPA to form a basis for an attainment status. The Las Vegas area within Clark County is designated as being in serious nonattainment of the NAAQS for CO and PM₁₀. The primary source (96 percent) of CO emissions is vehicle traffic in the Las Vegas area. More than 60 percent of PM₁₀ emissions in the Las Vegas Valley are from fugitive dust from construction activities, unpaved roads, and disturbed vacant lands.

In areas where the NAAQS are exceeded, preparation of a State Implementation Plan (SIP) detailing how the state would attain the standard within mandated time frames is required. Section 176c of the CAA provides that a federal agency cannot support an activity in any way unless the federal agency determines that the activity will conform to the SIP's purpose of attaining and maintaining the NAAQS, listed in Table 3-2. In accordance with this part of the CAA, the U.S. EPA announced promulgation of its final conformity rule for general federal actions for nonattainment and maintenance areas in the November 30, 1993, Federal Register (40 CFR Part 51). The final rule applies to Nellis AFB because the installation is situated within a nonattainment area for the NAAQS for CO and PM₁₀.

If emissions from a federal action do not exceed de minimis thresholds, and if the federal action is not considered a regionally significant action, it is exempt from further conformity analysis. De minimis thresholds are specified in the conformity rule for the criteria pollutants based on the degree of nonattainment of the area. The applicable de minimis thresholds for Clark County are 100 tons/year for CO and 70 tons/year for PM₁₀. A regionally significant action is defined as one whose total emissions meet or exceed 10 percent of the air quality control area's emission inventory for any criteria pollutant.

Table 3-2. National and Nevada Ambient Air Quality Standards

Pollutant	Nevada ^{(a)(b)}	National ^{(a)(b)}	Standard Type ^{(c)(d)}
Carbon Monoxide (CO)			
8-hour Average	9 ppm (10 mg/m ³) 6 ppm (6.67 mg/m ³) ^(e)	9 ppm (10 mg/m ³)	Primary
1-hour Average	35 ppm (40 mg/m ³)	35 ppm (40 mg/m ³)	Primary
Nitrogen Dioxide (NO ₂)			
Annual Arithmetic Mean	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)	Primary & Secondary
Ozone (O ₃)			
8-hour Average ^(f)	---	0.08 ppm (157 µg/m ³)	Primary & Secondary
1-hour Average	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)	Primary & Secondary
Sulfur Dioxide (SO ₂)			
Annual Arithmetic Mean	0.03 ppm (80 µg/m ³)	0.03 ppm (80 µg/m ³)	Primary
24-hour Average	0.14 ppm (365 µg/m ³)	0.14 ppm (365 µg/m ³)	Primary
3-hour Average	0.50 ppm (1,300 µg/m ³)	0.50 ppm (1,300 µg/m ³)	Secondary
Lead (Pb)			
Quarterly Average	1.5 µg/m ³	1.5 µg/m ³	Primary & Secondary
Particulate Matter Equal to or Less than 10 microns (PM ₁₀)			
Annual Arithmetic Mean	50 µg/m ³	50 µg/m ³	Primary & Secondary
24-hour Average	150 µg/m ³	150 µg/m ³	Primary & Secondary
Particulate Matter Equal to or Less than 2.5 microns (PM _{2.5}) ^(f)			
Annual Arithmetic Mean ^(f)	---	15 µg/m ³	Primary & Secondary
24-hour Average ^(f)	---	65 µg/m ³	Primary & Secondary
Hydrogen sulfide (H ₂ S)			
1-hour	112 µg/m ³	---	
Visibility Observation	In sufficient amount to reduce the prevailing visibility to less than 30 miles when the humidity is less than 70 percent	---	

Notes:

- (a) Standards other than for ozone and those based upon annual averages are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
- (b) Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parentheses.
- (c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the U.S. EPA.
- (d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the U.S. EPA approves the implementation plan.
- (e) First standard applies at elevations less than 5,000 feet above MSL. The second standard applies at elevations equal to or greater than 5,000 feet above MSL.
- (f) The ozone 8-hour standard and the PM_{2.5} standard are included for information only. A 1999 federal court ruling blocked implementation of these standards, which the U.S. EPA proposed in 1997. The ozone 8-hour standard has since been approved, but has yet to be implemented. A federal court ruling on the PM_{2.5} standard is still pending.

EPA = Environmental Protection Agency
 µg/m³ = micrograms per cubic meter
 mg/m³ = milligrams per cubic meter
 PM_{2.5} = particulate matter equal to or less than 2.5 microns in diameter
 PM₁₀ = particulate matter equal to or less than 10 microns in diameter
 ppm = parts per million

The baseline emission inventory for Nellis AFB is presented in Table 3-3. The SIP emission inventory for PM₁₀ and CO for Clark County is presented in Table 3-4. According to the baseline emission inventory for Nellis AFB, existing emissions of lead are zero and are not included in these tables.

**Table 3-3. Baseline Emission Inventory (2001), Nellis AFB
(tons per year)**

	PM ₁₀	CO	NO _x	SO _x	VOC
Total	36.0	17.7	32.7	4.5	59.7

CO = carbon monoxide
 NO_x = nitrogen oxides
 PM₁₀ = particulate matter equal to or less than 10 microns in diameter
 SO_x = sulfur oxides
 VOC = volatile organic compound

Source: TRW, Inc., 2002.

**Table 3-4. Clark County Emissions for Criteria Pollutants
(tons per year)**

	PM ₁₀	CO	NO _x	SO ₂	VOC
Total Emissions	333,133	168,825	43,004	2,064	N/A

CO = carbon monoxide
 N/A = not applicable
 NO_x = nitrogen oxides
 PM₁₀ = particulate matter equal to or less than 10 microns in diameter
 SO₂ = sulfur dioxide
 VOC = volatile organic compound

Sources: PM₁₀ State Implementation Plan, for Clark County (2001).
 Las Vegas Valley Carbon Monoxide State Implementation Plan (2000)

Nellis AFB holds a Title V/Part 70 permit for stationary emission sources including generators, internal combustion engines, abrasive cleaning, jet engine testing, fuel dispensing, welding, and surface coating. Mobile emission sources such as aircraft and on-road vehicles are not regulated by Title V of the CAA or the Clark County Part 70 permitting program (U.S. Air Force, 1999).

3.4.4 Noise

Noise is defined as sound that is undesirable because it interferes with speech, communication, and hearing; is intense enough to damage hearing; or is otherwise annoying. The decibel (dB), a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for the measurement of sound. A-weighted sound levels (dBA) de-emphasize low and very high frequencies and emphasize mid-range frequencies to represent the frequency response of the human ear. The day-night average sound level (DNL) was developed to evaluate the total community noise environment. DNL is the total A-weighted acoustical energy averaged over a 24-hour period, with a 10-dB adjustment added to the nighttime levels (between 10:00 p.m. and 7:00 a.m.). This adjustment accounts for the increased sensitivity to nighttime noise events. DNL is the accepted unit for quantifying human annoyance to general

environmental noise, which includes aircraft noise, and it is the most commonly used measurement for the evaluation of community noise impacts.

In accordance with the Air Installation Compatible Use Zone (AICUZ) program, a program designed to achieve compatible uses of public and private lands in the vicinity of military airfields, Nellis AFB has conducted noise studies for the base. DNL noise contours were generated by NOISEMAP, a computer program that produces contour maps indicating ground dB-level averages and noise exposure from aircraft operations. The noise contours used in this EA are from the base's 2003 AICUZ report.

Land use compatibility guidelines used in the AICUZ are the same as those published by the Federal Interagency Committee on Urban Noise in the Guidelines for Considering Noise in Land Use Planning and Control (U.S. Department of Transportation, 1980).

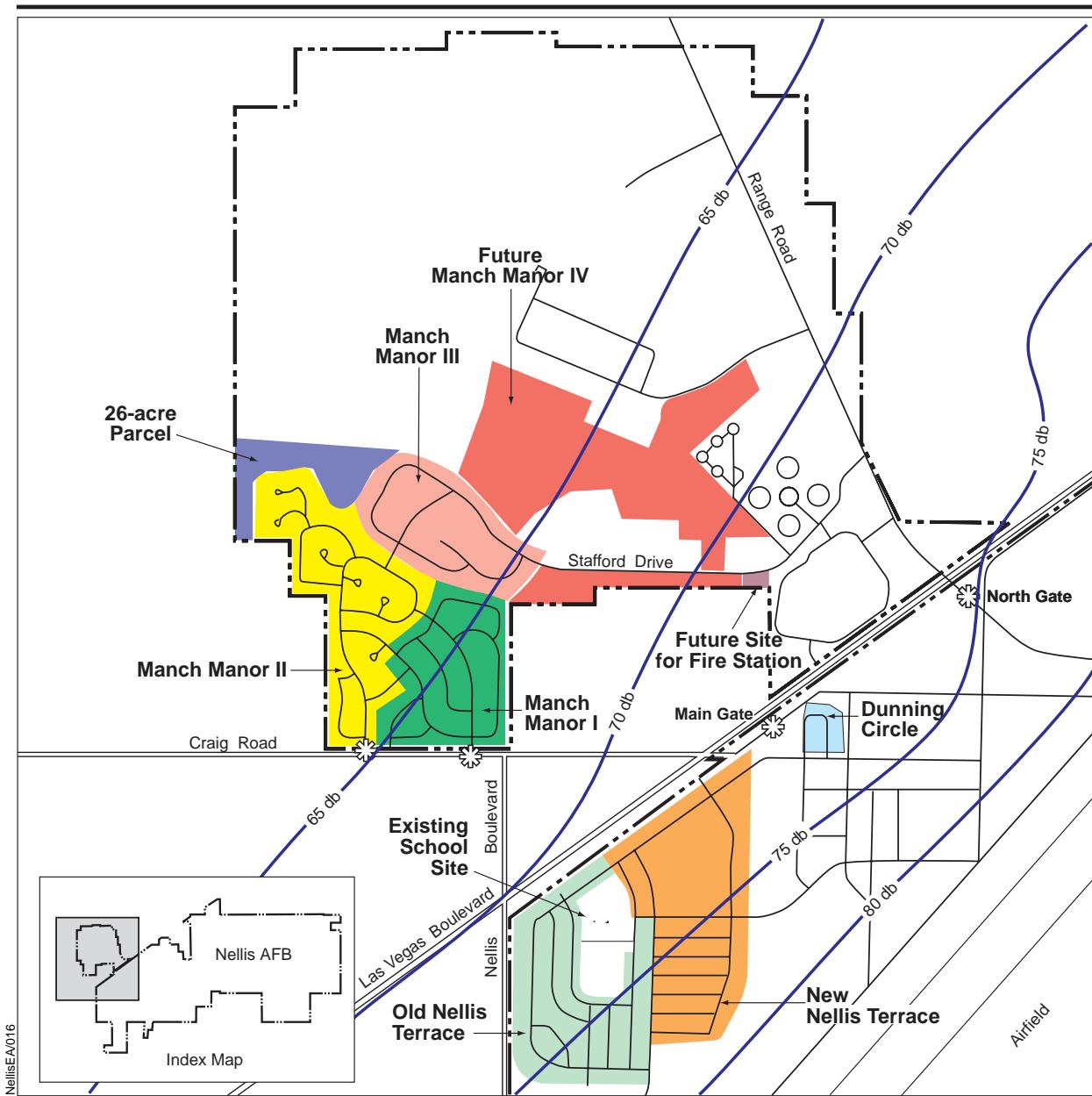
The ROI for the noise analysis includes the MFH area properties. The southeast portion of the Manch Manor housing area (the majority of Manch Manor I) is situated within the DNL 65-70 dB noise contour zone. The east portion of the proposed Manch Manor IV area is also situated within the DNL 65-70 dB noise contour zone. The Dunning Circle housing area and the northern and western portions of the Nellis Terrace housing area, including the school, are situated within the DNL 70-75 dB noise contour zone. The southeastern portion of the Nellis Terrace housing area, including a portion of both Old Nellis Terrace and New Nellis Terrace, is situated within the DNL 75-80 dB noise contour (Figure 3-4).

Residential development is generally not considered compatible within DNL 65 dB and greater noise contours. However, when residential development must be allowed within the DNL 65-75 dB range, measures to achieve outdoor-to-indoor noise level reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building design in order to achieve an indoor noise level that does not exceed 45 dB DNL. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and assume mechanical ventilation and closed windows year round. Residential development is not considered compatible within DNL 75 dB and greater noise contours even with the use of outdoor-to-indoor NLR.

The use of NLR will not eliminate outdoor noise problems. No restrictions are required for any land use within a DNL of 65 dB or lower.

3.4.5 Biological Resources

Biological resources include the native and introduced plants and animals in the project area. For discussion purposes, these resources have been separated into the following sections: vegetation, wildlife, threatened and endangered species, and sensitive habitats. The ROI for biological resources, which comprises the existing MFH areas and undeveloped area proposed for



EXPLANATION

- Base Boundary
- Gate Entrance
- 65 db — DNL Noise Contour (5-db intervals)

Nellis AFB Noise Contour Map



Figure 3-4

development as part of the MFH Revitalization Project, includes the area within which potential impacts could occur, and provides a basis for evaluating the level of impact.

3.4.5.1 Vegetation.

According to the Integrated Natural Resources Plan (INRMP) for Nellis AFB (Nellis Air Force Base, 2001), native base vegetation can be categorized as a creosote bush-white bursage (*Larrea tridentata-Ambrosia dumosa*) vegetative community (Vasek and Barbour, 1997). This vegetative community is supported by the valley floor of the Mojave Desert and occurs from sea level to approximately 3,900 feet above MSL. Although the majority of the base is developed, the creosote bush-white bursage community can be found in the majority of undisturbed areas. This plant community can contain, but is not limited to, saltbush (*Atriplex spp.*), prickly pears and chollas (*Opuntia sp.*), Joshua tree (*Yucca brevifolia*), Russian thistle (*Salsola kali*), desert trumpet (*Eriogonum inflatum*), cheesebush (*Hymenoclea salsola*), and ephedras (*Ephedra sp.*). The Manch Manor IV area contains approximately 86 acres of native Mojave Desert vegetation, although this area is traversed by several unpaved roads and the vegetation in this area appears to be disturbed.

Approximately 988 acres of the base are developed. Vegetation in much of this area, including the MFH areas, consists of turf grasses, ornamental shrubs, and shade trees typical of landscaped areas. Lawns are composed of Kentucky bluegrass (*Poa pratensis*), Italian domestic rye grass (*Lolium perenne var. multiflorum*), and creeping red fescue (*Festuca rubra [fallax]*). A variety of introduced and native deciduous trees, deciduous shrubs, evergreen trees, evergreen shrubs, perennials, and annuals are used on the base.

3.4.5.2 Wildlife.

Few species of native wildlife are found on the developed portions of Nellis AFB due to the lack of suitable habitat. The limited species that do occur most likely have the ability to adapt to urbanized landscape. However, the undisturbed regions throughout the remainder of the base boundary are suitable habitat to a diverse desert fauna. Due to the lack of suitable aquatic habitat, Nellis AFB does not have any native fish populations, with the exception of an introduced tui chub (*Gila bicolor*) population within the golf course pond.

Reptiles such as the side-blotched lizard (*Uta stansburiana*), zebra-tailed lizard (*Callisaurus draconoides*), western whiptail (*Cnemidophorus tigris*), common king snake (*Lampropeltis getulus*), sidewinder (*Crotalus cerastes*), chuckwalla (*Sauromalus obesus*), banded gila monster (*Heloderma suspectorum cinctum*), and desert tortoise (*Gopherus agassizii*) may be found in both the north and east undeveloped portions of Nellis AFB.

Birds, including the great tailed grackle (*Quiscalus major*), common rock dove (*Columba livia*), burrowing owl (*Athene cunicularia*), house sparrow (*Passer domesticus*), Costa's hummingbird (*Calypte costae*), roadrunner (*Geococcyx californica*), phainopepla (*Phainopepla nitens*), and mourning dove (*Zenaida*

macroura) can be found throughout the base, especially near the few areas of open water within the south portion. Periods of migration can result in fluctuating species diversity and population. The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712, as amended) provides for the protection of migratory birds and their nests and eggs.

Mammals that can be found on both the north and east undeveloped portions of the base include pocket mouse species (*Chaetodipus spp.*), kangaroo rat species (*Dipodomys spp.*), jackrabbit (*Lepus californicus*), western cottontail (*Sylvilagus audubon*), mule deer (*Odocoileus hemionus*), kit fox (*Vulpes macrotis*), badger (*Taxidea taxus*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*).

3.4.5.3 Threatened and Endangered Species.

According to the INRMP, there is one federally listed threatened species present at Nellis AFB (the desert tortoise). The desert tortoise, which is also state listed as threatened, is found in low densities in Area II of the base. Tortoises are not found within Areas I and III of the base (see Figure 1-2 for the locations of Areas I, II, and III). In April 2004 a survey for desert tortoises was conducted within Area III of Nellis AFB. The survey area included the 26-acre parcel and proposed Manch Manor IV areas. The results of the survey indicate that no desert tortoises are present within Area III (U.S. Air Force Environmental Conservation Program, 2004a).

Species of Concern

Three federal species of concern are also found on the main base. These are species that the U.S. Fish and Wildlife Service (USFWS) believe might be declining or in need of concentrated conservation action to prevent decline. The chuckwalla is a lizard that has been observed on rocky hillsides in the far eastern area of Area II. The banded gila monster is both a federal species of concern and a state-protected species, whose presence has been confirmed in Area II. The burrowing owl is a federal species of concern and a state-protected bird species. It has been observed at the sanitary landfill at the south end of the base and along the flood control channel on the southeast side of the base.

In addition, eight species of bats that are federal species of concern that occur on the Nellis Range may also occur on Nellis AFB (although the presence of these species on base has not been confirmed): western small footed myotis (*Myotis ciliolabrum*), Yuma myotis (*Myotis yumanensis*), long-legged myotis (*Myotis volans*), fringed myotis (*Myotis thysanodes*), long-eared myotis (*Myotis evotis*), cave myotis (*Myotis velifer brevis*), Allen's big-eared bat (*Leptonycteris phyllotis*), and Townsend's big-eared bat (*Plecotus townsendii*). In addition, one bat that is listed as state threatened, spotted bat (*Euderma maculatum*), also occurs on the Nellis Range and may also occur on Nellis AFB, although the presence of these species on base has not been confirmed. Habitats of particular importance to them include craggy cliff faces, caves, and abandoned mines. These habitats are not present in the vicinity of the MFH areas.

Two sensitive plant species are found on Nellis AFB: the Las Vegas bearpoppy (*Arctomecon californica*) and the Las Vegas buckwheat (*Eriogonum corymbosum* var. *glutinosum*). The Las Vegas bearpoppy has been identified as a species of concern by the USFWS, sensitive by the Nevada Natural Heritage Program, and is designated as "critically endangered" by the State of Nevada. The USFWS hopes to avoid listing the species as federally threatened by protecting existing populations on public lands. It is only found in Clark County, Nevada, and in Mohave County, Arizona. The population is declining due to habitat disturbance and development in the Las Vegas area (Nellis Air Force Base, 2001). Three bearpoppy populations are found in Areas II and III. The population in Area III is the largest on the base, occupying an area of approximately 450 acres north of, and adjacent to, the Manch Manor housing area. This 450-acre area is protected by the base. This area has been subjected to extensive clean-up operations to restore habitat, and fencing has been installed to eliminate disturbance. Additionally, Nellis AFB has established study plots and is monitoring the population annually.

The Las Vegas buckwheat, which is on the Nevada Heritage Program watch list of rare plants but has no federal or state designation, is found in Area III in the same general area as the bearpoppy. It is recommended for listing as "critically endangered" by the State of Nevada.

A plant survey was conducted on the 26-acre parcel in July 2002. No bearpoppies were observed during the survey, but several Las Vegas buckwheat plants were observed on the parcel (Nellis Air Force Base and U.S. Army Corps of Engineers, 2002). In April 2004 a survey for the Las Vegas bearpoppy and Las Vegas buckwheat was conducted within Area III of Nellis AFB. The survey area included the 26-acre parcel and proposed Manch Manor IV area. The results of the survey indicate that no bearpoppies are present in the 26-acre parcel, but a few were found in the proposed Manch Manor IV area. Several individual plants and a small, dense population of the Las Vegas buckwheat were found in the 26-acre parcel and additional individual plants were found in the proposed Manch Manor IV area (U.S. Air Force Environmental Conservation Program, 2004b).

3.4.5.4 Sensitive Habitats.

Sensitive habitats include wetlands and plant communities that are designated as unusual or of limited distribution and support important seasonal use for wildlife.

According to the INRMP, recent field surveys to assess wetland occurrences have been conducted. The results of these surveys indicate that the only potential wetlands on Nellis AFB are the man-made golf course ponds. The base natural resource specialist requested guidance from the U.S. Army Corp of Engineers (USACE) regarding the status of these man-made water sources. USACE personnel have indicated that the ponds are not subject to wetlands protection under the provisions of the CWA.

The protected 450-acre bearpoppy habitat is also considered a sensitive habitat.

3.4.6 Cultural Resources

Cultural resources are defined as prehistoric or historic archaeological sites, buildings, structures, districts, artifacts, or other physical evidence of human activity considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. For ease of discussion, cultural resources have been divided into prehistoric and historic archaeological resources, historic buildings and structures, and traditional cultural resources (e.g., sacred or ceremonial sites).

Numerous laws and regulations require federal agencies to consider the effects of a Proposed Action on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the federal agency proposing the action, and prescribe the relationships among other involved agencies (e.g., the State Historic Preservation Officer [SHPO] and the Advisory Council on Historic Preservation). The primary law governing the treatment of cultural resources is the National Historic Preservation Act (NHPA), which requires a federal agency to consider potential impacts on historic properties from any proposed undertaking.

Only those cultural resources determined to be significant under cultural resources legislation are subject to protection or consideration by a federal agency. Significant cultural resources, whether they be prehistoric, historic, or traditional in nature, are referred to as “historic properties.”

For the purposes of this analysis, the term ROI is synonymous with the “area of potential effect” as defined under cultural resources legislation. The ROI for the analysis of cultural resources within this EA includes any areas where ground disturbance, facility modification, or demolition may occur.

3.4.6.1 Prehistoric and Historic Archaeological Resources.

Nellis AFB has been surveyed for prehistoric and historic archaeological resources. One archaeological site eligible for nomination to the National Register of Historic Places (National Register) has been identified within Nellis AFB; this site is not within the MFH areas or areas proposed for development as part of the MFH Revitalization Project and is being managed for protection. No other sites within Nellis AFB have been determined to be eligible for nomination to the National Register. The SHPO has concurred that the final inventory and evaluation activities on Nellis AFB have been completed. Based on these findings, prehistoric and historic archaeological resources are not a concern within the any of the on-base areas that could be affected by the MFH Revitalization Project.

3.4.6.2 Historic Buildings and Structures.

Nellis AFB has been surveyed for historic buildings and structures. No historic properties eligible for nomination to the National Register were identified. The Nevada SHPO has concurred that the final inventory and evaluation activities on Nellis AFB for World War II-era resources have been completed. In addition, a

historic building inventory and evaluation (HBIE) has been completed for the Capehart and Wherry housing on Nellis AFB to determine if it should be considered and treated as historically significant. Capehart housing is found in the Manch Manor I housing area. Wherry housing is found in the Old Nellis Terrace and Dunning Circle housing areas. Results of the HBIE indicate that there are no Capehart or Wherry buildings eligible for inclusion in the National Register either individually or as elements of a historic district (U.S. Air Force, 2004). The Nevada SHPO has concurred with this finding (see letter from SHPO dated October 5, 2004 in Appendix B). Based on these findings, historic buildings and structures are not a concern within any of the on-base areas that could be affected by the MFH Revitalization Project.

3.4.6.3 Traditional Resources.

Nellis AFB has been working with Native American groups to identify traditional cultural resources, sacred areas, or traditional use areas (99th Civil Engineering Squadron, 2002c). The base continues to work with these groups to further identify these resources. To date, no known traditional cultural resources, sacred areas, or traditional use areas have been identified on Nellis AFB (U.S. Air Force, 1999). Based on these findings, traditional cultural resources are not a concern within the housing areas.

3.4.7 Environmental Justice

Executive Order (EO) 12898, Environmental Justice, was issued by the President on February 11, 1994. Objectives of the EO, as it pertains to this EA, include development of federal agency implementation strategies, identification of low-income and minority populations potentially affected because of proposed federal actions. Accompanying EO 12898 was a Presidential Transmittal Memorandum referencing existing federal statutes and regulations to be used in conjunction with EO 12898. One of the items in this memorandum was the use of the policies and procedures of NEPA. Specifically, the memorandum indicates that,

Each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. section 4321 et. seq.

Although an environmental justice analysis is not mandated by NEPA, DoD has directed that NEPA will be used as the primary mechanism to implement the provision of the EO.

3.4.7.1 Demographic Analysis.

Although EO 12898 provides no guidelines for determination of concentrations of low-income or minority populations, the demographic analysis provides information on the approximate locations of minority and low-income populations in the area potentially affected by the proposed federal action. Potential environmental impacts from the Proposed Action and alternatives would occur on and in the vicinity of the MFH areas.

Demographic information from the U.S. Bureau of the Census was used to extract data on minority and low-income populations within Clark County. The census reports both ethnicity and household income status. Minority populations included in the census are identified as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, or some other race. Based on the 2000 Census of Population and Housing, Clark County had a population of 1,375,765 persons. Of this total, 390,969 persons (28 percent) were minority. U.S. Census Bureau poverty status is used in this EA to define low-income status. Poverty status is reported for families with income below poverty level (\$18,267 for a family of four in 2001, as reported in the Census of Population and Housing). The most recent data available on poverty status are from 1989, as reported in the 1990 Census of Population and Housing. Based on a total of 728,830 persons for whom poverty status was determined, 76,737 persons (10 percent), were below poverty level and, therefore, considered low income (U.S. Census Bureau, 2002).

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter presents the results of the analysis of potential environmental effects of the MFH Revitalization Project. The Proposed Action, Alternative 1, Alternative 2, and the No-Action Alternative are analyzed. Changes to the natural and human environments that may result from the Proposed Action and alternatives were evaluated relative to the existing environment as described in Chapter 3.0. The potential for significant environmental consequences was evaluated utilizing the context and intensity considerations as defined in CEQ regulations for implementing the procedural provisions of NEPA (40 CFR Part 1508.27).

4.2 COMMUNITY SETTING

4.2.1 Socioeconomics

4.2.1.1 Proposed Action.

The MFH Revitalization Project would result in a net decrease of 100 housing units on Nellis AFB. This could result in an on-base population decrease of approximately 255 residents (based on the average household size of 2.55 persons in the Nellis AFB Housing Market Area). This would represent a 4-percent decrease in the current base population of 6,483 and would not be a significant change in the on-base population. No permanent changes in employment on the base would be expected. The employment associated with the renovation, demolition, and construction activities would represent a temporary increase in the workforce on the base; however, the construction workers are expected to come from the local area, and no permanent increase in the workforce is expected. Regional population and military payrolls within the region are not expected to change significantly. No significant impacts are anticipated.

4.2.1.2 Alternative 1.

Potential socioeconomic impacts under Alternative 1 would be similar to those described under the Proposed Action. The MFH Revitalization Project would not create a substantial change in the on-base or regional population. No permanent changes in employment on the base would be expected. A temporary increase in the workforce during project activities would be expected to come from the local area. Regional population and military payrolls within the region are not expected to change significantly. No significant impacts are anticipated.

4.2.1.3 Alternative 2.

Potential socioeconomic impacts under Alternative 2 would be similar to those described under the Proposed Action. The MFH Revitalization Project would not create a substantial change in on-base or regional population and employment.

No permanent changes in employment on the base would be expected. A temporary increase in the workforce during project activities would be expected to come from the local area. Regional population and military payrolls within the region are not expected to change significantly. No significant impacts are anticipated.

4.2.1.4 No-Action Alternative.

Under the No-Action Alternative, there would be no change in the number of MFH units on the base. Regional population and military payrolls are not expected to change as a result of the No-Action Alternative. No significant impacts are anticipated under the No-Action Alternative.

4.2.2 Land Use

4.2.2.1 Proposed Action.

Project activities associated with the Proposed Action would not result in significant impacts to land use. Each of the existing housing areas would remain residential areas, except the Old Nellis Terrace housing area, which would become vacant. Vacant land is not considered an incompatible use in a area designated for residential land uses. Manch Manor IV and the 26-acre parcel adjacent to Manch Manor II are currently designated as open space areas. According to the Nellis AFB General Plan (Higgenbotham/Briggs and Associates, 1997), future land use for these areas is designated as residential. Therefore, the development in these areas is considered consistent with future planned land uses.

The existing and future planned land use for the future site for the fire station is open space. Construction of this facility would disturb approximately 1 acre of land. Although this construction would not be consistent with the designated land use of the area, the area on which the fire station would be constructed is small. Impacts would not be considered significant.

4.2.2.2 Alternative 1.

Land use impacts from Alternative 1 would be similar to those described under the Proposed Action, which the exception of the 26-acre parcel, which has a future planned land use of residential. This area would not be developed and would remain as vacant land. As mentioned above, vacant land is not considered an incompatible use in a area designated for residential land uses. No significant impacts are anticipated.

4.2.2.3 Alternative 2.

Land use impacts from Alternative 2 would be similar to those described under the Proposed Action, except the Dunning Circle housing area and Manch Manor IV, which have future planned land uses of residential, would be left vacant after demolition of the housing units. As mentioned above, vacant land is not considered an incompatible use in an area designated for residential land uses.

In addition, new housing units would be constructed in the Old Nellis Terrace housing area after the completion of demolition activities. The planned future land use for Old Nellis Terrace is residential; therefore, new construction in this area would be consistent with the designated land use. No significant impacts are anticipated.

4.2.2.4 No-Action Alternative.

Under the No-Action Alternative, the MFH areas would remain at their current locations. The Manch Manor IV area would not be developed. No changes to existing land use would occur. No land use impacts are anticipated under the No-Action Alternative.

4.2.3 Aesthetics

4.2.3.1 Proposed Action.

The housing areas were determined to be of medium visual sensitivity. Because the housing areas and the majority of the surrounding environment is developed and the presence of motorized vehicles is common, activities associated with the Proposed Action would not significantly degrade the aesthetic quality of the area. These activities would be temporary, and the long-term effect of renovation of existing housing units and construction of new housing units would result in a positive aesthetic effect on the MFH areas. In addition, the landscaping of common areas and property perimeters and an increase in green space would enhance the aesthetic quality of the housing areas. Modern housing designs would be developed with the intent of creating an attractive appearance and a desirable community for residents in these areas. The Manch Manor IV area and the 26-acre parcel adjacent to Manch Manor II are open space areas adjacent to developed areas. These areas are also of medium visual sensitivity, and the development of these areas would not degrade the aesthetic quality of the area because they are situated adjacent to several developed areas, and human influence near these areas is obvious. The Old Nellis Terrace housing area and the school would be demolished, and the area would be left vacant. Although the area would change from a residential/community service area to a vacant lot, the aesthetic quality would not be expected to change because the paved areas would remain in place. No significant impacts are anticipated.

4.2.3.2 Alternative 1.

Impacts to aesthetics would be similar to those described under the Proposed Action, except that the 26-acre parcel adjacent to Manch Manor II would remain as open space. The Old Nellis Terrace area would be replanted with native plants and would appear as an open space area. No significant impacts are anticipated.

4.2.3.3 Alternative 2.

Impacts to aesthetics would be similar to those described under the Proposed Action except the Old Nellis Terrace housing area would be redeveloped, the school would not be demolished, and Manch Manor IV would remain as open space. The aesthetic quality of the Old Nellis Terrace housing area would improve as modern housing designs and new landscaping are incorporated into the development of the area. Therefore, no change in the aesthetic quality of these areas would occur and no significant impacts are anticipated.

4.2.3.4 No-Action Alternative.

Under the No-Action Alternative, the existing MFH areas would remain in their current condition. The undeveloped Manch Manor IV would remain undeveloped. No changes to the aesthetic environment would occur. No aesthetic impacts are anticipated under the No-Action Alternative.

4.2.4 Transportation

Direct and indirect traffic impacts were determined for key roadways related to each site location and are discussed in this section.

4.2.4.1 Proposed Action.

The Proposed Action would not generate significant additional traffic or significantly alter on-base or local traffic patterns within and around the MFH areas. An increase in on-base traffic may occur during the construction phase; however, this increase would be temporary and would be attributed to construction vehicle traffic to and from the housing areas. Truck traffic into the base, such as with construction material deliveries, and off the base, such as during the removal of demolition debris, would be scheduled to the extent possible to off peak-hours. Construction traffic routes through the Tyndall Gate for the activities at the Nellis Terrace and Dunning Circle housing areas and through the Craig Road gates into the Manch Manor housing area would minimize traffic impacts, as these routes are the most direct routes from off-base areas. These routes would avoid increasing traffic congestion at the Main Gate and within the base boundary, causing the least inconvenience to commuters on and off base. The increase in traffic attributed to construction activities is not anticipated to significantly affect on-base transportation networks.

Under the Proposed Action, there would be a net decrease of 100 housing units on base. As a result, the on-base population is expected to decrease by approximately 255 people. Therefore, no increase in traffic from the on-base population is expected. The proposed activities would also result in a change to the existing distribution of residents on base. There are a total of 679 housing units within the Nellis Terrace housing area. After completion of project activities, only 350 housing units would remain. The remainder of on-base housing, except for the four units within the Dunning Circle housing area, would be situated in Manch Manor. As a result, there would be an increase in the number of people commuting from the Manch Manor housing areas to Area I. There are currently

593 housing units within the Manch Manor housing areas. After project completion, the Manch Manor housing areas will contain 824 housing units.

Although the exact number of new residents commuting to Area I from Manch Manor cannot be determined, on average it is expected that one person per household would commute to Area I during peak-hour traffic periods. Therefore, the change in the housing distribution would result in an average increase of 231 vehicle trips during the peak-hour. Because the increase in vehicle trips would be the result of military personnel traveling to work, and not new visitors to the base, it is expected that this increase in traffic would be evenly distributed to the three closest gates to Manch Manor: the North Gate, Main Gate, and Tyndall Gate. This increase would not be significant compared to the existing traffic volumes resulting from the commute of the approximately 10,000 military and civilian personnel currently employed at the base. No significant impacts are anticipated.

4.2.4.2 Alternative 1.

Traffic impacts would be similar to those described under the Proposed Action. No significant impacts are anticipated.

4.2.4.3 Alternative 2.

Traffic impacts would be similar to those described under the Proposed Action. However, because the Old Nellis Terrace housing area would be redeveloped and the Manch Manor IV housing area would not be developed, no change in the distribution of on-base residents would occur. The number of residents commuting from the Manch Manor housing areas to Area I would be similar to present conditions. No significant impacts are anticipated.

4.2.4.4 No-Action Alternative.

Under the No-Action Alternative, no changes to existing traffic on on-base roadways or regional roads (i.e., Craig Road and North Fifth Street) are expected. There would be no changes to the distribution of the existing MFH areas. No significant impacts are anticipated.

4.2.5 Utilities

4.2.5.1 Proposed Action.

The MFH Revitalization Project would result in a decrease of 100 MFH units from the current 1,278 MFH units on base. Therefore, there would be a decrease in the demand on the base utility systems (water, wastewater, electricity, and natural gas).

Solid Waste. Under the Proposed Action, there would be a decrease in on-base population, and no increase in solid waste generation after completion of the MFH Revitalization Project is anticipated. However, building demolition and renovation activities would generate solid waste, including wood, drywall, cardboard, metals,

concrete, and roofing material. Building materials would be separated and recycled to the extent possible. The types and estimated quantities of building materials expected as a result of the Proposed Action are presented in Table 4-1. Demolition and renovation debris that cannot be recycled would be disposed of in an approved off-site landfill.

Table 4-1. Estimated Demolition and Renovation Debris, Proposed Action (tons)

Building Materials	Demolition Factor per 1,000 sq ft ^(a)	Renovation Factor per 1,000 sq ft ^(a)	Dunning Circle (Demolition)	Nellis Terrace (Demolition)	Manch Manor (Demolition)	Nellis Terrace (Renovation)	Elementary School
			13,249 sq ft	853,444 sq ft	468,868 sq ft	434,047 sq ft	62,212 sq ft
Wood	1.54	0.385	20.3	1,314.3	722.1	167.1	95.8
Drywall	0.42	0.12	15.9	1,024.1	562.6	182.3	74.7
Cardboard	0.045	0.016	0.6	38.4	21.1	6.9	2.8
Metals	0.053	0.019	0.7	45.2	24.8	8.2	3.3
Concrete	12.5	--	165.0	10,668.1	5,860.9	--	777.7
Roofing Material	0.9	--	11.9	768.1	422.0	--	56.0
Other	0.265	0.093	3.5	226.2	124.2	40.4	16.5
TOTAL			217.9	14,084.4	7,737.7	404.9	1,026.8

sq ft = square feet

Source: (a) Calculated from Peaks to Prairies, 2002.

Building demolition and renovation activities would create approximately 23,470 tons of solid waste (see Table 4-1). Approximately 75 percent of the material is expected to be concrete from building foundations, which could be stockpiled for future use. The remaining 6,000 tons of solid waste would be drywall, wood, roofing material, metals, glass, and other building materials. Debris from construction activities is typically uncontaminated and is reused or recycled whenever possible; the remainder of the material would be taken to an approved off-site landfill. Debris from demolition activities is often contaminated with nails, rebar, or other building materials that make recycling more difficult. The wood material may be chipped and reused as a fuel or mulch. Sheet metal, structural steel, and glass would be sold as scrap. Miscellaneous building materials such as electrical wire, outlet boxes, metallic tubing, light fixtures, pipe, plumbing fixtures, and heating systems would be salvaged and reused or sold as scrap. Even though a recycling program would be used, it would be impractical to accomplish complete source separation, and the remaining solid waste generated by building demolition and renovation activities would require disposal in a landfill. Because the regional landfill currently processes approximately 6,940 tons of municipal waste daily, disposal of the entire 6,000 tons of demolition debris that would be generated over the duration that construction, demolition, and renovation activities would occur (i.e., 8 years) is not expected to significantly affect the service life of the landfill.

4.2.5.2 Alternative 1.

Impacts to the utility systems, including water, wastewater, electricity, natural gas, and solid waste, would be similar to those described under the Proposed Action.

4.2.5.3 Alternative 2.

Impacts to the utility systems, including water, wastewater, electricity, and natural gas, would be similar to those described under the Proposed Action. No significant impacts are anticipated.

Solid Waste. Solid waste generation under Alternative 2 would be similar to that described under the Proposed Action except as noted. The types and estimated quantities of building materials expected as a result of Alternative 2 are presented in Table 4-2. Building demolition and renovation activities would create approximately 22,445 tons of solid waste. Approximately 75 percent of the material is expected to be concrete from concrete foundations, which could be stockpiled for future use. The remaining 5,750 tons of solid waste would be drywall, wood, roofing material, metals, glass, and other building materials. It is expected that over 50 percent of the bulk materials would be recycled. Even though a recycling program would be used, approximately 50 percent or 2,875 tons of the building materials would require disposal in a landfill. Because the regional landfill currently processes approximately 6,940 tons of municipal waste daily, disposal of the 2,875 tons of demolition debris over the duration that construction, demolition, and renovation activities would occur is not expected to significantly affect the service life of the landfill.

Table 4-2. Estimated Demolition and Renovation Debris, Alternative 2 (tons)

Building Materials	Demolition Factor per 1,000 sq ft ^(a)	Renovation Factor per 1,000 sq ft ^(a)	Dunning Circle (Demolition)	Nellis Terrace (Demolition)	Manch Manor (Demolition)	Nellis Terrace (Renovation)	Elementary School
Wood	1.54	0.385	13,249 sq ft	853,444 sq ft	468,868 sq ft	434,047 sq ft	62,212 sq ft
Drywall	0.12	0.42	20.3	1,314.3	722.1	167.1	--
Cardboard	0.045	0.016	0.6	38.4	21.1	6.9	--
Metals	0.053	0.019	0.7	45.2	24.8	8.2	--
Concrete	12.5	--	165.0	10,668.1	5,860.9	--	--
Roofing Material	0.9	--	11.9	768.1	422.0	--	--
Other	0.265	0.093	3.5	226.2	124.2	40.4	--
TOTAL			217.9	14,084.4	7,737.7	404.9	0

sq ft = square feet

Source: (a) Calculated from Peaks to Prairies, 2002.

Buildings with the potential to contain ACM and/or LBP would be sampled prior to demolition activities to ensure proper disposal and abatement of these materials. The construction contractor would be required to dispose of construction debris in

accordance with applicable federal, state, and local regulations. No significant impacts are anticipated.

4.2.5.4 No-Action Alternative.

No changes to utilities usage or generation are expected under the No-Action Alternative.

4.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

4.3.1 Hazardous Materials Management

4.3.1.1 Proposed Action.

During renovation, demolition, and construction activities on base, small amounts of hazardous materials are expected to be utilized by the development contractor; therefore, the potential for spills would exist. Hazardous materials likely to be utilized during project activities could include adhesives, motor fuels, paints, thinners, solvents, and petroleum, oil, and lubricants. All storage, handling, and transportation of hazardous materials would be conducted in accordance with applicable regulations and established procedures. Any spills or releases of hazardous materials would be cleaned up by the contractor. Hazardous materials utilized and stored at the newly constructed housing maintenance facility, the new fire station, and the new shoppette would be stored and used in accordance with applicable regulations. Occupants of the family housing areas would primarily use paints and household cleaning products. The new family housing areas and any new collateral facilities (i.e., housing maintenance facility, fire station, and shoppette) would be incorporated into the Nellis AFB and appropriate regional hazardous materials emergency response plans in the event that a release occurs. Because hazardous materials would be managed in accordance with applicable regulations, no significant impacts are anticipated.

4.3.1.2 Alternative 1.

Management of hazardous materials would be similar to that described under the Proposed Action. Because hazardous materials would be managed in accordance with applicable regulations, no significant impacts are anticipated.

4.3.1.3 Alternative 2.

Management of hazardous materials would be similar to that described under the Proposed Action. Because hazardous materials would be managed in accordance with applicable regulations, no significant impacts are anticipated.

4.3.1.4 No-Action Alternative.

Under the No-Action Alternative, small quantities of hazardous materials would continue to be stored and utilized at the fire station and shoppette within the Manch Manor housing area. Small quantities of household hazardous materials would also continue to be utilized and stored by residents in the housing areas.

Management of hazardous materials would continue in accordance with applicable regulations. No significant impacts are anticipated.

4.3.2 Hazardous Waste Management

4.3.2.1 Proposed Action.

Small quantities of hazardous waste would be generated during renovation, demolition, and construction activities. The development contractor would be responsible for following applicable regulations and the base's hazardous waste management plan for management of any hazardous waste generated. Any spills or releases of fuel or oil from construction equipment would be cleaned up by the contractor. Minimal quantities of hazardous waste generated by housing residents are exempt from storage or disposal regulations and reporting requirements. Small quantities of hazardous waste generated and stored at the new housing maintenance facility, the shoppette, and the fire station, would be managed in accordance with applicable regulations. The contract between the Air Force and the contractor would contain a clause or clauses to ensure proper management of hazardous waste and continued regulatory compliance. Because hazardous waste would be managed in accordance with applicable regulations, no significant impacts are anticipated.

4.3.2.2 Alternative 1.

Management of hazardous waste would be similar to that described under the Proposed Action. Because hazardous waste would be managed in accordance with applicable regulations, no significant impacts are anticipated.

4.3.2.3 Alternative 2.

Management of hazardous waste would be similar to that described under the Proposed Action. Because hazardous waste would be managed in accordance with applicable regulations, no significant impacts are anticipated.

4.3.2.4 No-Action Alternative.

Under the No-Action Alternative, small quantities of household hazardous waste would continue to be generated by housing residents and at the fire station. Management of hazardous waste would continue in accordance with applicable regulations. No significant impacts are anticipated.

4.3.3 Environmental Restoration Program Sites

4.3.3.1 Proposed Action.

There are no active ERP sites or AOCs within the housing areas. Active ERP sites are situated adjacent to the housing areas; however, groundwater contaminants do not underlie the housing areas, and contaminants are not expected to migrate toward the housing areas. The Air Force would retain right-of-access to the properties to inspect monitoring wells or conduct other remedial

activities, if necessary. No land use restrictions would be required. No impacts are anticipated to or from ongoing ERP site remediation activities.

4.3.3.2 Alternative 1.

Impacts from ERP sites would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.3.3 Alternative 2.

Impacts from ERP sites would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.3.4 No-Action Alternative.

Under the No-Action Alternative, no project activities would occur in the housing areas and there would be no potential for impacts to or from ERP sites. No significant impacts are anticipated.

4.3.4 Storage Tanks

4.3.4.1 Proposed Action.

Under the Proposed Action, the AST situated at Building 3366 (fire station) would be removed prior to the demolition of the fire station. No storage tanks are proposed for installation under the Proposed Action; therefore, no significant impacts are anticipated.

4.3.4.2 Alternative 1.

Management of storage tanks would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.4.3 Alternative 2.

Management of storage tanks would be similar to that described under the Proposed Action. No significant impacts are anticipated.

4.3.4.4 No-Action Alternative.

Under the No-Action Alternative, the AST situated at Building 3366 would continue to be utilized for the back-up generator at the fire station. Management of the tank would continue to be the responsibility of the Air Force. Proper management of this tank would minimize the potential for impacts. No significant impacts are anticipated.

4.3.5 Pesticide Usage

4.3.5.1 Proposed Action.

No changes in pesticide usage at the Nellis Terrace, Manch Manor, and Dunning Circle housing areas are expected under the Proposed Action. The areas would continue to be used for residential purposes. Pesticide application practices and types of pesticides applied are not expected to change. Pesticide application would be conducted in accordance with applicable laws and label instructions to minimize impacts.

Chlordane was applied in the MFH areas until 1988. Standard procedures for chlordane treatment of buildings entailed direct application of chlordane to the soils surrounding building foundations. Chlordane is a persistent chemical and, is still present in the soils in the MFH areas. As discussed in Section 3.3.5, in addition to chlordane, the pesticides DDD, DDE, DDT, endrin, dieldrin, and heptachlor were also detected in soil samples collected in the MFH areas, although only chlordane was detected in every sample. Of the pesticides detected, only chlordane, DDE, dieldrin, and heptachlor were detected in concentrations exceeding U.S. EPA Region IX residential PRGs for soil. Because the Proposed Action would involve disturbance of the soils in the MFH areas, there is a potential for construction workers and residents to be exposed to chlordane and other pesticides through contaminated soil and dust. Prior to initiation of demolition and construction activities, the construction contractor or privatization developer would be required to prepare a health and safety plan in accordance with OSHA requirements that would address potential hazards to workers and residents from contaminated soil during demolition and construction activities. If soils where pesticides were applied are to be excavated, the contractor/developer would be responsible for conducting any additional sampling and health screening to determine levels of worker safety, potential exposure levels of excavated soils retained on site, and to properly characterize and manage the soil in accordance with federal and state regulations. After construction activities are completed, the contractor/developer would retest soils in areas not covered by paved surfaces or building foundations for the presence of pesticides. Pesticide concentrations would be required to be less than their respective residential PRGs. It is not anticipated that soils would be removed off site as part of the MFH revitalization activities; however, should any soils containing pesticide concentrations greater than RCRA hazardous waste levels need to be disposed off site, they would be handled and treated as hazardous waste. No significant impacts are anticipated.

4.3.5.2 Alternative 1.

Potential impacts from pesticide usage would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.5.3 Alternative 2.

Potential impacts from pesticide usage would be the same as that described under the Proposed Action. No significant impacts are anticipated.

4.3.5.4 No-Action Alternative.

Under the No-Action Alternative, pesticides would continue to be applied in the MFH areas, as necessary. Potential chlordane-contaminated soils would not be disturbed by activities associated with the demolition and construction of MFH units. No changes in pesticides usage would occur. No significant impacts are anticipated.

4.3.6 Asbestos-Containing Material

4.3.6.1 Proposed Action.

Under the Proposed Action, ACM would likely be encountered during renovation and demolition activities associated with project activities. In addition to ACM being encountered in housing units, ACM could be encountered within the water distribution and/or sanitary sewer system during any work performed on piping within these systems. Renovation and demolition activities would be subject to applicable federal, state, and local regulations to minimize the potential risk to human health and the environment. ACM waste generated as a result of renovation or demolition activities would be disposed of in accordance with applicable regulations. Management of ACM and ACM waste in accordance with applicable regulations would preclude any significant impacts. The Air Force contractor would be responsible for ensuring the proper management of asbestos and maintaining continued regulatory compliance. Additionally, the development contractor would be advised, to the extent known, of the type, condition, and amount of ACM present within housing units conveyed. No significant impacts are anticipated.

4.3.6.2 Alternative 1.

Potential impacts from ACM would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.6.3 Alternative 2.

Potential impacts from ACM would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.6.4 No-Action Alternative.

Under the No-Action Alternative, the Air Force would continue to be responsible for the management of structures containing ACM within the housing areas. The Air Force would continue to manage ACM in accordance with current Air Force policy and applicable regulations. Management of ACM and ACM waste in accordance with applicable regulations would preclude any significant impacts.

4.3.7 Lead-Based Paint

4.3.7.1 Proposed Action.

Under the Proposed Action, LBP would likely be encountered during demolition activities associated with project activities. Demolition activities would be conducted in accordance with applicable federal, state, and local regulations to minimize potential risks to human health and the environment. Building components (e.g., window frames, door jambs) containing LBP would be segregated from other demolition debris and would be tested prior to disposal to determine if it is a hazardous waste as defined by 40 CFR Section 261. Debris containing concentrations of lead greater than or equal to 5 milligrams per liter (mg/l) would be disposed of as a hazardous waste. Management of LBP and LBP waste in accordance with applicable regulations would preclude any significant impacts. The Air Force contractor would be responsible for ensuring the proper management of LBP and maintaining continued regulatory compliance. No significant impacts are anticipated.

4.3.7.2 Alternative 1.

Potential impacts from LBP would be the same as those discussed under the Proposed Action. No significant impacts are anticipated.

4.3.7.3 Alternative 2.

Potential impacts from LBP would be the same as those discussed under the Proposed Action. No significant impacts are anticipated.

4.3.7.4 No-Action Alternative.

Under the No-Action Alternative, the Air Force would continue to be responsible for the management of LBP within the housing areas. The Air Force would continue to manage LBP in accordance with current Air Force policy and applicable regulations. Appropriate management of LBP and LBP waste in accordance with applicable regulations would preclude any significant impacts.

4.3.8 Radon

4.3.8.1 Proposed Action.

Housing units that have been surveyed and found to have elevated radon levels have been abated. The development contractor would be advised of radon survey results for facilities with readings above the U.S. EPA-recommended action level prior to conveyance of the housing units. There are no radon survey results for a number of housing units, and radon levels within these housing units are not known. The development contractor would be notified of the location of housing units where radon survey results are not available. Because Nellis AFB is a "medium-risk" installation for occurrence of radon, construction of the new

MFH units would incorporate measures to reduce radon levels within the structures. No significant impacts are anticipated.

4.3.8.2 Alternative 1.

Potential impacts from radon would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.8.3 Alternative 2.

Potential impacts from radon would be the same as those described under the Proposed Action. No significant impacts are anticipated.

4.3.8.4 No-Action Alternative.

Under the No-Action Alternative, project activities would not be conducted, and the Air Force would continue to be responsible for the management and abatement of radon within housing units, as under current conditions. No significant impacts are anticipated.

4.4 NATURAL ENVIRONMENT

4.4.1 Geology and Soils

4.4.1.1 Proposed Action.

Geology

The Proposed Action is unlikely to affect the local geology of the Nellis AFB area. No sedimentation patterns would be significantly altered, and no structural movements or changes in seismicity would result. No significant impacts are anticipated.

Soils

Impacts to soil within Nellis AFB from the Proposed Action would be minimal and would result primarily from ground disturbance associated with the demolition of existing structures and the construction of new buildings or infrastructure. These activities could alter soil profiles and local topography, as grading is required for both the demolition and construction activities. The potential for soil erosion and sediment transport is not high in any of the areas potentially affected by the proposed activities, since the topography is relatively flat.

The construction contractor would be required to obtain a General Stormwater Permit under the NPDES program from the Nevada Bureau of Water Pollution Control before initiating any construction activity. The contractor would also be required to prepare an SWPPP for the construction activity because these activities would not be covered under the existing Industrial SWPPP. The General Stormwater permit, together with the required SWPPP, would outline strict construction site management practices designed to protect the quality of

the surface water, groundwater, and natural environment through which they flow. The SWPPP would identify specific areas of existing and potential soil erosion, location of structural measures for sediment control, and management practices and controls. Use of these management practices and controls would reduce the potential for erosion of disturbed soils.

Under the Proposed Action, demolition activities would disturb approximately 62 acres within the Nellis Terrace housing area, approximately 182 acres within the existing Manch Manor housing area, approximately 5 acres within the Dunning Circle housing area, and approximately 12 acres at the existing school site. During construction activities, the 26-acre parcel adjacent to Manch Manor II, the 86-acre Manch Manor IV parcel, and the future site for the fire station would be disturbed. Also during construction, much of the remaining acreage in the Manch Manor and Dunning Circle housing areas, already disturbed during demolition activities, would be disturbed again during construction activities.

Although local soils are not especially susceptible to erosion (based on local topography and climate), short-term impacts could still occur during ground-disturbing activities, such as demolition of existing facilities, removal of vegetative cover, or grading. Impacts would be minimized through proper management practices defined within the approved SWPPP. Standard construction BMPs that could be implemented to minimize soil erosion include:

- Use of protective cover, such as mulch, straw, plastic netting, or a combination of these protective coverings
- Implementation of site grading procedures to limit the time soils are exposed prior to being covered by impermeable surfaces or vegetation
- Implementation of storm water diversions to reduce water flow through exposed sites
- Maintenance of a buffer strip of vegetation around a pond or drainage, where possible, to filter sediments
- Retention of as many trees and shrubs as possible adjacent to exposed ground areas for use as natural windbreaks.

Once disturbed areas have been covered with pavement, buildings, or vegetation, their susceptibility to erosion is significantly reduced. Upon completion of the construction phase, maintenance of a vegetative cover or gravel-covered areas would serve as effective, long-term erosion control strategies for areas not covered with impervious surfaces. Soils underlying facilities and pavements are not subject to erosion.

Because BMPs required by the developer's General Stormwater Permit and SWPPP would be implemented during construction activities, no significant impacts to soils are anticipated.

4.4.1.2 Alternative 1.

Geology

Impacts would be similar to those described under the Proposed Action. No significant impacts are anticipated.

Soils

Impacts would be similar to those described under the Proposed Action except that the 26-acre parcel adjacent to Manch Manor II would not be disturbed by construction activities. Because BMPs and standard construction practices, as discussed for on-base areas, would be implemented, no significant impacts to soils are anticipated.

4.4.1.3 Alternative 2.

Geology

Impacts would be similar to those described under the Proposed Action. No significant impacts are anticipated.

Soils

Impacts would be similar to those described under the Proposed Action except that the school would not be demolished, and the 86-acre Manch Manor IV parcel would not be disturbed by construction activities. After demolition of the housing units within the Dunning Circle housing area, no construction activities would occur. Because BMPs and standard construction practices, as discussed for on-base areas, would be implemented, no significant impacts to soils are anticipated.

4.4.1.4 No-Action Alternative.

Under the No-Action Alternative, no renovation, demolition, or construction would occur in the housing areas. Therefore, no significant impacts to geology and soils are anticipated.

4.4.2 Water Resources

4.4.2.1 Proposed Action.

Surface Water

Construction of new housing units within the 26-acre parcel adjacent to Manch Manor II, Manch Manor IV area, the future school site, and the future site for the fire station could result in a slight increase in storm water runoff. Increased storm water runoff may occur after construction due to an increase in impervious surfaces. However, the effects of increased runoff on surface water would be minimized through compliance with requirements of the General Stormwater

Permit and the SWPPP. Because the majority of the areas affected are currently developed, including the existing Nellis Terrace, Manch Manor, and Dunning Circle housing areas, the construction of replacement housing units is not expected to substantially alter the surface runoff from the base.

As discussed in Section 4.4, Geology and Soils, the proposed activities would be subject to General Stormwater Permit requirements for storm water discharge during the construction period and during operations. Issuance of a General Stormwater Permit is contingent on the development of an SWPPP by the permittee, which would then be subject to approval by the regional water authority. SWPPP requirements under the General Stormwater Permit include an outline of the storm water drainage system for each discharge point, actual and potential pollutant contact, and surface water locations. The SWPPP would also incorporate storm water management controls and preventive maintenance for buildings. Compliance with the General Stormwater Permit and the SWPPP would minimize potential impacts to surface water quantity and quality.

Because incidents of flooding are known to occur within Manch Manor II, the surface water drainage is known to be inadequate. Under the Proposed Action, these incidents of flooding would no longer occur because proper storm water management practices would be implemented. Surface water drainage structures would be incorporated into the design of the housing areas to control surface water and prevent incidents of flooding. Therefore, the existing deficiency in surface water drainage in Manch Manor II would no longer be of concern. No significant impacts to surface water are anticipated.

Groundwater

Under the Proposed Action, there is no potential for direct contamination of groundwater. There are no major sources of potential contamination within the proposed housing areas. Activities associated with the renovation, demolition, and construction would not introduce any contaminants with the potential to affect groundwater. No significant impacts to groundwater are anticipated.

4.4.2.2 Alternative 1.

Surface Water

Impacts would be similar to those described under the Proposed Action. No significant impacts to surface water are anticipated.

Groundwater

Impacts would be similar to those described under the Proposed Action. No significant impacts to groundwater are anticipated.

4.4.2.3 Alternative 2.

Surface Water

Impacts would be similar to those described under the Proposed Action. No significant impacts to surface water are anticipated.

Groundwater

Impacts would be similar to those described under the Proposed Action. No significant impacts to groundwater are anticipated.

4.4.2.4 No-Action Alternative.

Under the No-Action Alternative, no renovation, demolition, or construction would occur in the housing areas. Therefore, no significant impacts to surface water or groundwater are anticipated.

4.4.3 Air Quality

4.4.3.1 Proposed Action.

Activities associated with the Proposed Action, including renovation, demolition, and construction would not result in significant air quality impacts. During renovation of the 350 MFH units in New Nellis Terrace, there may be an increase in emissions as a result of the travel of construction employees to and from the units being renovated and from increased commute distances for temporarily displaced residents. The potential also exists for VOC emissions from paints and other renovation materials. The contractor would follow standard practices to minimize emissions during renovation activities. Since the renovations are expected to occur over the course of approximately 8 years, annual emissions increases from renovation activities would not be significant.

Demolition activities associated with the Proposed Action would result in short-term impacts to air quality from emissions generated by demolition of 915 existing MFH units, the fire station, shoppette, and the school. Following demolition activities, construction of 815 MFH units, the fire station, and the school would occur. Impacts are expected to be primarily from fugitive dust associated with building demolition, clearing and grading of the land for new building construction, and construction vehicles traveling on unpaved surfaces at the site. Dust emissions would also be generated by removal and replacement of roads and utilities, and through construction of new vehicle parking and common areas, driveways, sidewalks, and recreational areas.

Emissions of PM₁₀ generated by building demolition and construction, grading, and landscaping were calculated using emission factors and methodology from the U.S. EPA's AP-42 document (U.S. Environmental Protection Agency, 1995) and the URBEMIS model (URBEMIS7G for Windows, Version 5.1.0, 2000), which uses emission factors listed in the South Coast Air Quality Management District's (SCAQMD's) California Environmental Quality Act (CEQA) Air Quality Handbook.

These emission factors are representative for the Clark County area. For mobile construction equipment, the Sacramento Metropolitan Air Quality Management District (SMAQMD) Air Quality Thresholds of Significance (1994) was used to calculate emissions of CO, NO_x, and VOCs. Emissions of CO, NO_x, and VOCs would be produced in exhaust from both on-site construction equipment and workers' vehicles traveling to and from the work site. Appendix A presents details on the air emission calculations used in this analysis.

Because an actual construction timetable for the Proposed Action has not yet been developed, the schedule for demolition and construction presented in Table 4-3, was developed for purposes of air emission analysis only. Table 4-4 presents the total construction emissions calculated for each year of the Proposed Action.

Table 4-3. Assumed Project Demolition and Construction Schedule

Year(s)	Number of Multi-Family Units Demolished per Year	Number of Multi-Family Units Constructed per Year	Percent of Total Acres Disturbed
2004	0	205	25
2005	230	122	15
2006-2009	137	122	15
2010	137	0	0
Total	915	815	100

**Table 4-4. Proposed Action Construction Emissions for Criteria Pollutants
(tons per year)**

Year	PM ₁₀	CO	NO _x	VOC	SO ₂
2004	40.09	0.26	187.86	20.56	15.70
2005	26.20	0.16	113.59	12.39	9.46
2006-2009	25.35	0.16	113.59	12.39	9.46
2010	1.27	0	0	0	0
De minimis threshold	70	100	NA	NA	NA
10-percent of Clark County Inventory	17,178	13,108	4,356	NA	205

Note: PM₁₀ emissions include combustion and fugitive emissions.
 CO = carbon monoxide
 NA = not applicable
 NO_x = nitrogen oxides
 PM₁₀ = particulate matter equal to or less than 10 microns in diameter
 SO₂ = sulfur dioxide
 VOC = volatile organic compound

The emissions for the Proposed Action shown in Table 4-4 assume use of standard construction mitigation practices, such as watering exposed surfaces twice per day or frequently enough to keep the surface moist at all times, and watering all haul roads three times per day to reduce dust and particulate emissions. According to the CEQA Handbook, regular watering of construction and demolition areas decreases PM₁₀ emissions by up to 75 percent. Proper vehicle maintenance is also assumed, which would reduce emissions of NO_x, PM₁₀, and VOCs by 5 percent. Construction emissions would cause an elevated,

short-term increase in emissions at receptors close to the construction areas. However, federal regulations (40 CFR Part 70) consider fugitive (associated with construction activities) and mobile sources exempt from a facility's emissions inventory. Thus, the Proposed Action would not affect the base's Title V/Part 70 permit for stationary emissions sources.

The increase in emissions from the Proposed Action is considered minimal when compared to the total emissions for Clark County in 1998 (see Table 3-4). The emissions associated with the Proposed Action would increase countywide emissions by less than 1 percent annually and would not hinder maintenance of the NAAQS within the ROI. Based on these findings, no significant impacts to air quality would occur from construction or demolition activities associated with the Proposed Action.

Because there would be no increase in on-base population or employment under the Proposed Action, no long-term impacts to air quality resulting from significant changes in commuting habits are anticipated.

Because Nellis AFB is in a nonattainment area for PM₁₀ and CO, an air conformity applicability analysis was conducted for the Proposed Action. Based on the serious nonattainment status for both these pollutants, the threshold for significant air pollutants is 70 tons/year for PM₁₀ and 100 tons/year for CO. As shown in Table 4-4, emissions generated by the Proposed Action would not exceed these thresholds in any year. These emissions also do not exceed 10 percent of the county air emission inventory for these pollutants and therefore would not be regionally significant. Because these emissions would be de minimis and would not be regionally significant, a conformity determination is not required.

4.4.3.2 Alternative 1.

Impacts to air quality would be similar to those described under the Proposed Action except that the 26-acre parcel adjacent to Manch Manor II and approximately 0.5 acre of the future site for the fire station would not be disturbed. However, because the differences in the annual amount of disturbance between the Proposed Action and Alternative 1 when distributed over a period of 7 years would be negligible, the annual air emissions generated under Alternative 1 would be similar to those that would occur under the Proposed Action as shown in Table 4-4. No significant impacts are anticipated.

Because the air emissions from Alternative 1 would be similar to those that would occur under the Proposed Action, they would also be de minimis and not regionally significant. Therefore, a conformity determination for Alternative 1 is not required.

4.4.3.3 Alternative 2.

Impacts to air quality would be similar to those described under the Proposed Action except that the 86-acre Manch Manor IV parcel would not be disturbed. However, because the differences in the annual amount of disturbance between

the Proposed Action and Alternative 2 when distributed over a period of seven years would be negligible, the annual air emissions generated under Alternative 2 would be similar to those that would occur under the Proposed Action as shown in Table 4-4. No significant impacts are anticipated.

Because the air emissions from Alternative 2 would be similar to those that would occur under the Proposed Action, they would also be de minimis and not regionally significant. Therefore a conformity determination for Alternative 2 is not required.

4.4.3.4 No-Action Alternative.

Under the No-Action Alternative, no renovation, demolition, or construction activities associated with the MFH Revitalization Project would occur on Nellis AFB. No significant impacts to air quality are anticipated.

4.4.4 Noise

4.4.4.1 Proposed Action.

The Dunning Circle housing area and a portion of both the Old Nellis Terrace and New Nellis Terrace housing areas, including the school, are situated within the DNL 70-75 dB noise contour. Residential uses and schools are not considered a compatible land use within this noise contour unless measures to achieve outdoor-to-indoor NLR are incorporated into building construction. The remaining portion of the Old Nellis Terrace and New Nellis Terrace housing areas is situated within the DNL 75-80 dB noise contour. Under the Proposed Action, all the MFH units within the Old Nellis Terrace housing area and the Lomie Heard Elementary School would be demolished and reconstructed elsewhere. Therefore, the incompatible land uses within the Old Nellis Terrace housing area and the elementary school would be eliminated. The housing units within the New Nellis Terrace housing area would be renovated by incorporating features to achieve an outdoor-to-indoor NLR to meet local HUD standards; therefore, this residential land use would be compatible with its location within the 70-75 dB DNL noise contour. The four SOQ units that would be constructed within the Dunning Circle housing area after the demolition of the existing housing units would also include features to achieve the same outdoor-to-indoor NLR. Residential uses are not considered compatible within DNL noise contours of 75 dB or greater. Therefore, although housing units in the portion of the New Nellis Terrace housing area within the DNL 75-80 db noise contour would continue to be an incompatible land use, this would not represent a change from existing conditions. In addition, these housing units would be renovated with features to achieve an outdoor-to-indoor NLR to meet local HUD standards. Renovation of the housing units within this area would require additional sound insulation features than would be needed on the units within the quieter noise contours. However, use of NLR would not eliminate any outdoor noise problems.

New housing units and a new school would be constructed in the Manch Manor area. The Manch Manor I and IV areas are partially within the DNL 65-70 dB noise contour. Residential uses and schools are also considered an incompatible

land use within this noise contour unless measures to achieve outdoor-to-indoor NLR are incorporated into building construction. Therefore, the MFH units and the school that would be constructed within the DNL 65-70 dB noise contour would have to include features to achieve an outdoor-to-indoor NLR to meet local HUD standards. However, use of NLR would not eliminate any outdoor noise problems.

Temporary impacts from construction noise could occur during renovations and construction within the housing areas. Noise generated by construction equipment could produce localized noise events of 100 dBA or higher at the construction site, with noise levels decreasing with distance from the site. According to OSHA, a recent study of construction noise found noise levels ranging from 93 dBA to 107 dBA at construction sites. Typical noise levels generated by construction tools range from 65 dBA to 110 dBA. A heavy truck would typically create a noise level of approximately 90 dBA at a distance of 50 feet, and a “backup” alarm on a truck could range from 90 to 95 dBA. These noise levels are not comparable to the noise levels discussed for aircraft noise. Within this document, aircraft noise has been discussed in terms of an average sound level that evaluates the total daily community noise environment, while the construction noise is discussed in terms of the noise level of the equipment while in operation or the activity at a certain distance. As these noises are temporary, and only affect areas close to the construction area, they are not averaged as part of the DNL.

Enforcement of OSHA guidelines for hearing protection for workers on the construction site would be the responsibility of the construction contractor. Noise from construction activities would decrease with distance through divergence, atmospheric absorption, shielding by intervening structures, and absorption and shielding by ground cover. Signs warning residents of high noise levels would be posted at the construction site by the construction contractor, if construction noise levels warrant this measure. While noise may be a temporary source of annoyance for residents, it would not be at levels that would require hearing protection measures.

Noise generated from proposed renovation, demolition, and construction activities would be intermittent and short term, and would primarily occur at the construction site. Once development activities are completed, proposed activities (i.e., residential) are not expected to generate a substantial amount of noise. Therefore, no significant impacts are anticipated.

4.4.4.2 Alternative 1.

Potential noise impacts under Alternative 1 would be similar to those described under the Proposed Action except that six housing units, instead of four, would be constructed within the Dunning Circle housing area after the demolition of the existing housing units. These six units would have to include features to achieve an outdoor-to-indoor NLR to meet local HUD standards. No significant impacts are anticipated.

4.4.4.3 Alternative 2.

Potential noise impacts under Alternative 2 would be similar to those described under the Proposed Action. However, no housing units would be constructed within the Dunning Circle housing area after the demolition of the existing housing units, thereby eliminating this residential land use that is within the DNL 70-75 dB noise contour. In addition, the 329 MFH units in Old Nellis Terrace would be demolished and 171 new units would be constructed within this same area. Because this area is situated within the DNL 70-75 dB and 75-80 dB noise contours, these new units would include features to achieve an outdoor-to-indoor NLR to meet local HUD standards. It is recommended that construction of new housing units in the Old Nellis Terrace area be restricted to the area within the DNL 70-75 dB noise contour. However, use of NLR would not eliminate any outdoor noise problems.

Because the Lomie Heard Elementary School would not be relocated, it would remain within the DNL 70-75 dB noise contour. The school would continue to be an incompatible land use within this noise level unless measures to achieve outdoor-to-indoor NLR are incorporated into the school. However, because the presence of the school within this noise contour would not represent any change from existing conditions, this would not be a significant impact created by this project. No significant impacts are anticipated.

4.4.4.4 No-Action Alternative.

Under the No-Action Alternative, no renovation, demolition, or construction would occur in the MFH areas would not be conveyed. No changes to the noise environment would occur. However, the Dunning Circle and Nellis Terrace housing areas and a portion of the Manch Manor housing area would continue to be incompatibly situated within the DNL 65 dB and greater noise contours without incorporation of features to achieve outdoor-to-indoor NLR. However, this would not represent a change from existing conditions. Therefore, no significant impacts from noise are anticipated under the No-Action Alternative.

4.4.5 Biological Resources

4.4.5.1 Proposed Action.

Vegetation

Vegetation would be disturbed during demolition and construction activities associated with the Proposed Action. Within the existing MFH areas, the majority of the vegetation consists of landscaped areas containing nonnative grasses, ornamental shrubs, and shade trees associated with residential development. Impacts to such highly disturbed, human-created habitats are considered to be insignificant. Existing landscaping would be retained during demolition and construction activities to the extent possible, and the MFH areas would be landscaped upon completion of construction activities. Project activities would also result in the destruction of approximately 86 acres of disturbed native desert vegetation in the Manch Manor IV area and the 26-acre parcel adjacent to Manch

Manor II. The 26-acre parcel is part of the base's protected bearpoppy habitat. Impacts to the bearpoppy habitat are discussed in more detail under the Threatened and Endangered Species Subsection. The loss of approximately 86 acres of common native desert vegetation would not be considered a significant impact, since this vegetation is common elsewhere in the region. No significant impacts are anticipated.

Wildlife

Under the Proposed Action, demolition, renovation, and construction activities within the MFH areas could temporarily affect some individual wildlife species. However, because most of the land associated with the housing areas has been developed, these areas and adjacent areas lack suitable wildlife habitat. Most of the species known to inhabit the area are common and/or disturbance tolerant. Potential impacts to wildlife include displacement of individuals to adjacent areas and direct mortality to burrowing species (e.g., mice, rats, and lizards) or individuals that are less mobile. These impacts to the common wildlife species are not expected to be significant. The construction contractor would be required to avoid destroying any migratory birds and their nests that may be present in accordance with the provisions of the Migratory Bird Treaty Act.

Threatened and Endangered Species

No federal- or state-threatened or endangered species are known to occur in or adjacent to the MFH areas, Manch Manor IV, or the future school site.

The Las Vegas bearpoppy is a federal species of concern. The 26-acre parcel adjacent to Manch Manor II is part of the base's 450-acre protected bearpoppy area. This portion of the bearpoppy area has been disturbed, and no bearpoppies were observed during plant surveys that were conducted in this area in July 2002 and April 2004. However, several bearpoppies were found in the proposed Manch Manor IV area. In addition, the Las Vegas buckwheat is present in both the 26-acre parcel and proposed Manch Manor IV area. Prior to initiation of construction in these areas, Nellis AFB would allow any approved agency to collect seeds from either of these plant species, and would coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within these areas for transfer to the Las Vegas Springs Preserve. The salvaged topsoil would be used to assist in the creation of a habitat at the preserve for rare plants that occur in the Las Vegas Valley. Because these activities would be conducted as part of the Proposed Action, no significant impacts are anticipated.

Sensitive Habitat

The only sensitive habitat that could be affected by the Proposed Action is the bearpoppy habitat situated within the 26-acre parcel adjacent to Manch Manor II. However, as discussed under the Threatened and Endangered Species Subsection, no bearpoppies have been observed in this area. In addition, Nellis AFB would allow seed collection and salvaging of topsoil from this area prior to initiation of construction activities in this area to create a habitat for rare plants at

the Las Vegas Springs Preserve. Therefore, no significant impacts to sensitive habitat are expected.

4.4.5.2 Alternative 1.

Vegetation

Potential impacts to vegetation would be similar to those described under the Proposed Action except that after demolition of the Old Nellis Terrace housing area and Lomie Heard Elementary School, this area would be replanted using native desert plants. This would result in approximately 74 acres of native desert vegetation and would partially offset the loss of approximately 86 acres of native desert vegetation that would be lost during activities proposed in Manch Manor IV. No significant impacts are anticipated.

Wildlife

Potential impacts to wildlife would be similar to those described under the Proposed Action. No significant impacts are anticipated.

Threatened and Endangered Species

Potential impacts to threatened and endangered species would be similar to those described under the Proposed Action except that the 26-acre parcel adjacent to Manch Manor II would not be developed. As described under the Proposed Action, Nellis AFB would allow seed collection prior to initiation of construction in the Manch Manor IV area and would coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the Manch Manor IV area for transfer to the Las Vegas Springs Preserve. No significant impacts are anticipated.

Sensitive Habitat

Potential impacts to sensitive habitats would be similar to those described under the Proposed Action except that the bearpoppy habitat in the 26-acre parcel adjacent to Manch Manor II would not be developed. No significant impacts area anticipated.

4.4.5.3 Alternative 2.

Vegetation

Potential impacts to vegetation would be similar to those described under the Proposed Action except that the approximately 86 acres of native desert vegetation present in the Manch Manor IV area would not be destroyed. No significant impacts are anticipated.

Wildlife

Potential impacts to wildlife would be similar to those described under the Proposed Action. No significant impacts are anticipated.

Threatened and Endangered Species

Potential impacts to threatened and endangered species would be similar to those described under the Proposed Action except that the Manch Manor IV area would not be developed. As described under the Proposed Action, Nellis AFB would allow seed collection prior to initiation of construction in the 26-acre parcel and would coordinate with the Nevada Division of Forestry on salvaging topsoil from the Las Vegas bearpoppy and Las Vegas buckwheat habitat within the 26-acre parcel for transfer to the Las Vegas Springs Preserve. No significant impacts are anticipated.

Sensitive Habitat

Potential impacts to sensitive habitat would be similar to those described under the Proposed Action. No significant impacts are anticipated.

4.4.5.4 No-Action Alternative.

Vegetation

Development of the Manch Manor IV would not occur; therefore, the approximately 86 acres of native desert vegetation in this area would not be destroyed. No significant impacts are anticipated.

Wildlife

Under the No-Action Alternative, the displacement of local wildlife to adjacent areas and direct mortality to burrowing species (e.g., mice, rats, and lizards) or individuals that are less mobile would not occur. No significant impacts are anticipated.

Threatened and Endangered Species

No loss of threatened and endangered species or their habitat would occur. No significant impacts are anticipated.

Sensitive Habitat

No loss of threatened and endangered species or their habitat would occur. No significant impacts are anticipated.

4.4.6 Cultural Resources

4.4.6.1 Proposed Action.

Prehistoric and Historic Archaeological Resources

There are no prehistoric or historic archaeological properties within the on-base areas affected by project activities, and there is little likelihood for them to occur. No prehistoric or historic archaeological resources are expected to be affected under the Proposed Action.

In the event that archaeological resources are unexpectedly uncovered during the course of demolition or construction activities, the Nellis AFB Archaeologist and Cultural Resources Manager would be notified and appropriate actions would be taken in accordance with the procedures outlined in the Nellis Air Force Base Cultural Resources Management Plan (U.S. Air Force, 1998). No significant impacts are anticipated.

Historic Buildings and Structures

There are no historic buildings or structures within the areas affected by project activities. The Capehart and Wherry housing in the Nellis AFB MFH areas have been evaluated and are not considered eligible for inclusion in the National Register. No historic buildings or structures are expected to be affected under the Proposed Action. No significant impacts are anticipated.

Traditional Resources

No traditional cultural resources, sacred areas, or traditional use areas have been identified on the base. The base continues to work with Native American groups to further identify these resources. Because these resources have not been identified to date, no significant impacts are anticipated.

4.4.6.2 Alternative 1.

Prehistoric and Historic Archaeological Resources

Potential impacts to prehistoric and historic archaeological resources would be the same as those described under the Proposed Action.

Historic Buildings and Structures

Potential impacts to historic building and structures would be the same as those described under the Proposed Action.

Traditional Resources

Potential impacts to traditional resources would be the same as those described under the Proposed Action.

4.4.6.3 Alternative 2.

Prehistoric and Historic Archaeological Resources

Potential impacts to prehistoric and historic archaeological resources would be the same as those described under the Proposed Action.

Historic Buildings and Structures

Potential impacts to historic building and structures would be the same as those described under the Proposed Action.

Traditional Resources

Potential impacts to traditional resources would be the same as those described under the Proposed Action.

4.4.6.4 No-Action Alternative.

Under the No-Action Alternative, no renovation, demolition, or construction associated with the MFH Revitalization Project would occur on Nellis AFB would not be conveyed and subject to subsequent development.

4.4.7 Environmental Justice

Environmental justice impacts could occur if minority and/or low-income communities are subjected to disproportionately high and adverse environmental impacts. Based upon the analysis conducted for this EA, it was determined that activities associated with the Proposed Action and alternatives would not have a significant impact on any of the resources analyzed in this EA. In addition, impacts to the resources analyzed in this EA, with the exceptions of air quality and noise, would generally be confined to the project sites and, therefore, there would be no adverse impacts to adjacent communities. Impacts to air quality would occur basinwide; therefore, no disproportionately high and adverse air quality impacts to minority and low-income populations would be expected. Off-site areas adjacent to the project sites could be exposed to noise from construction and/or demolition activities; however, although this may be a temporary source of annoyance to residents, these impacts would not present a noise hazard. Therefore, no disproportionately high and adverse noise impacts to low-income and minority populations would be expected.

4.5 COMPATIBILITY OF THE PROPOSED ACTION WITH OBJECTIVES OF FEDERAL, STATE, REGIONAL, AND LOCAL LAND USE PLANS AND POLICIES AND RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The Proposed Action and alternatives promote the Air Force's intention to improve MFH at Nellis AFB. The Proposed Action and alternatives would not adversely affect federal, state, regional, or local land use plans and policies.

The Proposed Action and alternatives would not affect the long-term productivity of the environment because no significant environmental impacts are anticipated, and natural resources would not be depleted.

4.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analyses include identification of ". . .any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations.

Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., the disturbance of a cultural site).

Since construction or renovation would occur as part of the proposed action, materials required for this type of activity would be used. Such items include wood, concrete, pipe, glass, sand, bricks and steel for 815 houses, as well as insulation, wiring, and paint for those new housing units plus an additional 350 renovated housing units. Although the use of heavy construction and earth-moving equipment does not comprise a major portion of the proposed action, the fuel consumption from community construction crews and from minor on-site equipment operations during the 8-year construction and renovation period would be irretrievable. Habitat for common wildlife species would be lost, or at least made unavailable until such time as the housing units might be demolished and the site allowed to return to a natural state. Construction in the 26-acre parcel and proposed Manch Manor IV area would result in the loss of habitat for two sensitive plant species, the Las Vegas bearpoppy and Las Vegas buckwheat. Prior to the loss of this habitat, Nellis AFB would allow collection of seeds and salvaging of topsoil to create habitat for rare plants at a preserve.

4.7 CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Cumulative impacts result from "the incremental impact of actions when added to other past, present, and reasonably foreseeable future actions, regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (Council on Environmental Quality, 1978).

Residential, commercial, and industrial development and population growth would occur in Clark County and the vicinity of Nellis AFB, and various MILCON projects may also occur on Nellis AFB during the 8-year time frame for the MFH Revitalization Project. Impacts from other development projects and population growth in the region in conjunction with the impacts from the MFH Revitalization Project present the potential for cumulative impacts. No significant impacts would occur from the MFH Revitalization Project. However for some resources, the impact of the MFH Revitalization Project when combined with other projects may be cumulatively significant. For other resource areas, either no impacts were

identified (e.g., ERP sites), and/or potential impacts are limited to the project site (e.g., cultural resources); therefore, no cumulative impacts would occur to these resources. Resource areas for which potential cumulative impacts could occur include air quality and biological resources.

Air emissions from MFH Revitalization Project construction and demolition activities could contribute to regional air quality impacts. The Clark County Air Pollution Control District would review emissions generated by development projects and implement control measures required for the region to demonstrate attainment of the NAAQS.

The loss of native vegetation on base could contribute to a cumulative loss of native vegetation and wildlife in the region from other development projects on-and off-base. While this cumulative loss would be an adverse impact to the native desert vegetation and the wildlife that inhabits it, native Mojave Desert vegetation is abundant in the area. Many areas surrounding the Las Vegas Basin are public lands that are unlikely to be developed. Native desert vegetation in these areas is generally protected and would be expected to continue to exist. Construction in the 26-acre parcel and proposed Manch Manor IV area would result in the loss of habitat for two sensitive plant species, the Las Vegas bearpoppy and Las Vegas buckwheat. Nellis AFB would allow collection of seeds and salvaging of topsoil to create habitat for rare plants at a preserve in order to minimize the cumulative impact of this loss of habitat.

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B.S., 1999, Environmental Biology, Humboldt State University, Arcata, California

Years of Experience: 2

Lynn McIntosh, Senior Environmental Professional, Earth Tech

B.S., 1981, Land Use Planning, Resource Management, University of Wisconsin, Eau Claire

Graduate Work, Resource Management, University of Wisconsin, Stevens Point

Years of Experience: 15

Joesph Nixon, Senior Cultural Resources Manager, Earth Tech

Ph.D., 1978, Anthropology, Southern Illinois University, Carbondale

B.A., 1969, Microbiology, Southern Illinois University, Carbondale

Years of Experience: 24

Mark Personius, AICP, Senior Project Manager, Earth Tech

M.A. Candidate, 1988, Geography, University of Minnesota

B.A., 1984, Geography, Humboldt State University, Arcata, California

Years of Experience: 15

Ray Ramos, Air Quality Professional, Earth Tech

M.S., 1997, Atmospheric Science, University of Wisconsin, Milwaukee

B.S., 1995, Atmospheric Science, University of Wisconsin, Milwaukee

Years of Experience: 5

Carl Rykaczewski, Project Environmental Professional, Earth Tech
B.S., 1981, Environmental Resource Management, Penn State University, University Park
Years of Experience: 13

Bill Sandeen, Nellis AFB
M.S., Forestry, Stephen F. Austin State University, Nacogdoches, Texas
B.S., Forestry, Stephen F. Austin State University, Nacogdoches, Texas
Years of Experience: 30

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APPENDIX A

AIR EMISSIONS CALCULATIONS

**Table A-1. Construction/Demolition URBEMIS7G Inputs and Assumptions
Proposed Action**

Parameter	Year 1 (2004)	Year 2 (2005)	Years 3-6 (2006-2009) ^(a)	Year 7 (2010)
Land Use	Multi-family Units	Multi-family Units	Multi-family Units	Multi-family Units
Number of Units Built	205	122	122	0
Disturbed Acres	77	46.2	46.2	0
Demolition				
Total Width Demolished (ft) ^(b)	0	711	550	550
Total Length Demolished (ft) ^(b)	0	711	550	550
Total Height Demolished (ft) ^(b)	0	20	20	20
Units Demolished Per Day	0	1	1	1
Construction Equipment^(c)				
Site Grading Tracked Loaders	14	8	8	0
Site Grading Wheeled Loaders	14	8	8	0
Site Grading Motor Graders	14	8	8	0
Asphalt Acres to be Paved	6.625	4.025	4.05	0
Total Days to Pave	250	250	250	0
Stationary Equipment Units	52	32	32	0
Mobile 175 HP Diesel Fork Lifts	26	16	16	0
Mobile Diesel Trucks	26	16	16	0

Notes: (a) Values shown are per year.

(b) Each housing unit is assumed to be 2200 ft² in area and 20 ft high.

(c) Construction equipment based on URBEMIS7G default values:

1 tracked loader per 10 acres land disturbed

1 wheeled loader per 10 acres land disturbed

1 motor grader per 10 acres land disturbed

1 forklift per 10 units constructed

1 dump truck per 10 units constructed.

Table A-2. Construction/Demolition URBEMIS7G Inputs and Assumptions
Alternative 1

Parameter	Year 1 (2004)	Year 2 (2005)	Years 3-6 (2006-2009) ^(a)	Year 7 (2010)
Land Use	Multi-family Units	Multi-family Units	Multi-family Units	Multi-family Units
Number of Units Built	205	122	122	0
Disturbed Acres	70.4	42.2	42.2	0
Demolition				
Total Width Demolished (ft) ^(b)	0	711	550	550
Total Length Demolished (ft) ^(b)	0	711	550	550
Total Height Demolished (ft) ^(b)	0	20	20	20
Units Demolished Per Day	0	1	1	1
Construction Equipment^(c)				
Site Grading Tracked Loaders	12	8	8	0
Site Grading Wheeled Loaders	12	8	8	0
Site Grading Motor Graders	12	8	8	0
Asphalt Acres to be Paved	6.625	4.025	4.05	0
Total Days to Pave	250	250	250	0
Stationary Equipment Units	52	32	32	0
Mobile 175 HP Diesel Fork Lifts	26	16	16	0
Mobile Diesel Trucks	26	16	16	0

Notes: (a) Values shown are per year.

(b) Each housing unit is assumed to be 2200 ft² in area and 20 ft high.

(c) Construction equipment based on URBEMIS7G default values:

1 tracked loader per 10 acres land disturbed

1 wheeled loader per 10 acres land disturbed

1 motor grader per 10 acres land disturbed

1 forklift per 10 units constructed

1 dump truck per 10 units constructed.

Table A-3. Construction/Demolition URBEMIS7G Inputs and Assumptions
Alternative 2

Parameter	Year 1 (2004)	Year 2 (2005)	Years 3-6 (2006-2009) ^(a)	Year 7 (2010)
Land Use	Multi-family Units	Multi-family Units	Multi-family Units	Multi-family Units
Number of Units Built	205	122	122	0
Disturbed Acres	64.5	38.7	38.7	0
Demolition				
Total Width Demolished (ft) ^(b)	0	711	550	550
Total Length Demolished (ft) ^(b)	0	711	550	550
Total Height Demolished (ft) ^(b)	0	20	20	20
Units Demolished Per Day	0	1	1	1
Construction Equipment ^(c)				
Site Grading Tracked Loaders	14	8	8	0
Site Grading Wheeled Loaders	14	8	8	0
Site Grading Motor Graders	14	8	8	0
Asphalt Acres to be Paved	6.625	4.025	4.05	0
Total Days to Pave	250	250	250	0
Stationary Equipment Units	52	32	32	0
Mobile 175 HP Diesel Fork Lifts	26	16	16	0
Mobile Diesel Trucks	26	16	16	0

Notes: (a) Values shown are per year.

(b) Each housing unit is assumed to be 2200 ft² in area and 20 ft high.

(c) Construction equipment based on URBEMIS7G default values:

1 tracked loader per 10 acres land disturbed

1 wheeled loader per 10 acres land disturbed

1 motor grader per 10 acres land disturbed

1 forklift per 10 units constructed

1 dump truck per 10 units constructed.

Table A-4. URBEMIS7G Mitigation Measures

Mitigation Measures	Emissions Reduction
Water exposed surfaces 2x per day	68% PM10 emission reduction
Properly maintain equipment	5% reduction in ROG, NOx, CO, PM10, and SOx
Water all haul roads 3x per day	75% PM10 emission reduction

SAMPLE CALCULATIONS

DEMOLITION EMISSIONS (UNCONTROLLED)

$$\text{PM10 (pounds per day)} = (0.00042 \text{ lb PM10/ft}^3) * (\text{N} * \text{O} * \text{P}) / \text{Q}$$

where:

N = Building Width (ft)

O = Building Length (ft)

P = Building Height (ft)

Q = No. of Days Required to Demolish Buildings

Source: Table A9-9-H of the South Coast Air Quality Management District's (SCAQMD's) California Environmental Quality Act (CEQA) Air Quality Handbook (SCAQMD 1993)

For the Proposed Action Year 2,

$$\begin{aligned}\text{Uncontrolled PM (lb/day)} &= (0.00042 \text{ lb PM10/ft}^3) * (711 * 711 * 20) / 250 \\ &= 18.46 \\ \text{Uncontrolled PM (ton/yr)} &= 2.31\end{aligned}$$

** Control measures implemented include proper maintenance of equipment which reduces the PM10 emissions by 5%.

$$\text{Controlled PM (ton/yr)} = 2.19$$

GRADING EQUIPMENT EMISSIONS (UNCONTROLLED)

$$\text{Emissions (pounds per day)} = \text{pounds of pollutant emitted per hour} * \text{hours per day for each equipment type operated}$$

where:

pounds of pollutant emitted per hour is based on specific emission factors for each type of equipment

Source: U.S. Environmental Protection Agency 1985, Sacramento Metropolitan Air Quality

Sample calculation:

For the Proposed Action Year 1 for a diesel powered tracked loader,

$$\begin{aligned}\text{Uncontrolled PM (ton/yr)} &= (0.095 \text{ lb PM10/hr}) * (8\text{hr/day}) * (365 \text{ day/yr}) * (1 \text{ ton}/2000 \text{ lb}) \\ &= 0.14\end{aligned}$$

** Control measures implemented include watering of haul roads three times per day and proper

$$\text{Controlled PM (ton/yr)} = 0.03$$

SAMPLE CALCULATIONS (continued)

FUGITIVE DUST

$$\text{PM10 (pounds per day)} = (220 \text{ pounds PM10/acre-month}) * (\text{month}/22\text{days}) * (\text{acres graded per day})$$

where:

It is conservatively assumed that the entire acreage disturbed is graded every day.

Source: South Coast Air Quality Management District, Midwest Research Institute, 1995.

Sample calculation:

For the Proposed Action Year 1,

$$\begin{aligned} \text{Uncontrolled PM (ton/yr)} &= (220 \text{ lb PM10/acre-month}) * (\text{month}/22 \text{ days}) * (77 \text{ acres}) * (250 \text{ days/yr}) * (1 \text{ ton}/2000 \text{ lb}) \\ &= 96.25 \end{aligned}$$

** Control measures implemented include watering of exposed areas twice per day and proper

$$\text{Controlled PM (ton/yr)} = 30.80$$

ASPHALT PAVING

$$\text{VOC (pounds per day)} = (2.62 \text{ pounds VOC/acre}) * (\text{total acres paved}) * (\text{paving days})$$

where:

Total acres paved was calculated by URBEMIS7G program based on land use.

Source: Sacramento Metropolitan Air Quality Management District, 1994.

Sample calculation:

For the Proposed Action Year 1,

$$\begin{aligned} \text{Uncontrolled VOC (ton/yr)} &= (2.62 \text{ pounds VOC/acre}) * (6.625 \text{ total acres paved}) * (250 \text{ paving days}) \\ &\quad * (1 \text{ ton}/2000 \text{ lb}) \\ &= 2.17 \end{aligned}$$

** Control measures implemented include using low VOC asphalt which reduces the VOC

$$\text{Controlled VOC (ton/yr)} = 2.06$$

SAMPLE CALCULATIONS **(continued)**

STATIONARY EQUIPMENT

VOC (pounds per day)	=	(0.168 pounds VOC per unit or thousands of square feet) * (number of units or thousands of square feet)
NOx (pounds per day)	=	(0.137 pounds NOx per unit of thousands of square feet) * (number of units or thousands of square feet)
PM10 (pounds per day)	=	(0.008 pounds PM10 per unit of thousands of square feet) * (number of units or thousands of square feet)

where:

Number of units is the number of housing units and thousands of square feet is for commercial land uses.

Source: Sacramento Metropolitan Air Quality Management District, 1995.

Sample calculation:

For the Proposed Action Year 1,

$$\begin{aligned} \text{Uncontrolled VOC (ton/yr)} &= (0.168 \text{ pounds VOC/unit}) * (265 \text{ units}) * (250 \text{ days/yr}) * (1 \text{ ton}/2000 \text{ lb}) \\ &= 5.57 \end{aligned}$$

** Control measures implemented include properly maintaining equipment which reduces the VOC,

$$\text{Controlled VOC (ton/yr)} = 5.29$$

MOBILE EQUIPMENT

$$\text{Emissions (pounds per day)} = (\text{pounds of pollutant emitted per hour}) * (\text{hours per day for each equipment type operated})$$

where:

pounds of pollutant emitted per hour is based on specific emission factors for each type of equipment

Source: Sacramento Metropolitan Air Quality Management District, 1994.

Sample calculation:

For a diesel-powered forklift (175 horsepower) the Proposed Action Year 1,

$$\begin{aligned} \text{Uncontrolled VOC (ton/yr)} &= (0.053 \text{ pounds VOC/hour}) * (8 \text{ hr/day}) * (250 \text{ days/yr}) * (1 \text{ ton}/2000 \text{ lb}) \\ &= 0.05 \end{aligned}$$

** Control measures implemented include properly maintaining equipment which reduces the VOC,

$$\text{Controlled VOC (ton/yr)} = 0.05$$

APPENDIX B

AGENCY CORRESPONDENCE



NEVADA DEPARTMENT OF WILDLIFE
Southern Region

4747 West Vegas Drive • Las Vegas, Nevada 89108
(702) 486-5127 Fax (702) 486-5133

March 15, 2004

Mr. Robert Lopez
HQ AFCEE/TDG
3300 Sidney Brooks
Brooks City-Base, TX 78235-5112

NDOW SR# 04-129

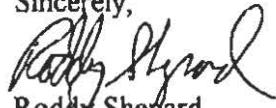
RE: Draft EA for the Military Family Housing Revitalization Project at Nellis AFB Nevada

Dear Mr. Lopez:

Thank you for providing us with a copy of this document. Largely due to its type and location, the Nevada Department of Wildlife respectfully declines the opportunity to comment on this project. Your continued invitations to comment on any upcoming projects that may impact local wildlife populations would be greatly appreciated.

If you have any questions, please feel free to contact me at rshepard@ndow.org, or by phone at (702) 486-5127 ext. 3613.

Sincerely,


Roddy Shepard
Habitat Biologist

RS: rs
cc: Files, NDOW



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502
(775) 861-6300 ~ Fax: (775) 861-6301



March 24, 2004
File No. 1-S-04-TA-455 and AF 6

Mr. Robert Lopez
Department of the Air Force
Headquarters Air Force Center for Environmental Excellence
Brooks Air Force Base Texas
3300 Sidney Brooks
Brooks City-Base, Texas 78235-5112

Dear Mr. Lopez:

Subject: Comments on the Draft Environmental Assessment for the Military Family Housing Revitalization Project, Nellis Air Force Base, Clark County, Nevada

The Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (EA) for the Military Family Housing (MFH) Revitalization Project at Nellis Air Force Base (AFB), located in Clark County, Nevada. The Draft EA evaluates the potential environmental impacts that may result from the proposed action, which includes renovation of MFH units in the New Nellis Terrace, demolition of MFH in the Old Nellis Terrace, demolition and construction of MFH units in the Dunning Circle and Manch Manor housing areas, and construction of MFH units on two vacant parcels of land adjacent to Manch Manor.

Our comments are prepared under the authority, and in accordance with the provisions of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321-4347), Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 et seq.), and other authorities mandating that the Department of Interior's environmental concerns be addressed. Specifically, our comments relate to several sensitive biological resources, including the federally listed (threatened) desert tortoise (*Gopherus agassizii*) (Mojave population), the State listed (critically endangered) Las Vegas bearpoppy (*Arctomecon californica*), and the Las Vegas buckwheat (*Eriogonum corymbosum* var. *glutinosum*), a species proposed for State listing as critically endangered.

Under the proposed action, the loss of 26 acres of habitat suitable for Las Vegas bearpoppy and occupied by the Las Vegas buckwheat would be incurred. Also, construction of Manch Manor IV would result in the loss of an additional 86 acres of relatively undisturbed Mojave Desert scrub, which supports suitable habitat for both plant species as well as the desert tortoise. The

habitat most suitable for the two plant species within the 86 acres is contiguous with but currently outside of a fenced conservation area designated specifically to protect the Las Vegas bearpoppy. Surveys for sensitive plant species were conducted on the 26-acre parcel in 2002, but no plant surveys were performed on the 86-acre parcel. We recommend surveys be conducted for all sensitive plant species on this parcel prior to design and construction of the proposed project.

Additionally, the EA states that desert tortoises are not known to occur in Area III of Nellis AFB; therefore, the determination was made that the proposed project would have "no effect" on this species. This determination is based on 1991 surveys for desert tortoise throughout Nellis AFB by Sierra Delta Corporation. Given that no recent surveys have been conducted and suitable, intact habitat exists on the 86-acre parcel, as well as the fact that the species is known to occur on other areas of Nellis AFB, we are unable to agree with the "no effect" determination for this project component. To ensure that *take* of the desert tortoise does not occur on the 86-acre parcel, we recommend that qualified Nellis AFB biologists or consultants conduct surveys for the desert tortoise prior to design and construction of the proposed activities on the parcel. Based on the results of the surveys, the appropriate level of section 7 consultation with the Service should be conducted.

Natural habitats continue to be lost at an increasingly rapid rate in the Las Vegas Valley; therefore, we recommend that the Air Force utilize areas previously disturbed by Nellis AFB activities or MFH to the extent practicable. Avoiding disturbance of undeveloped areas will facilitate conservation of Mojave Desert habitats occupied by sensitive species in the Las Vegas Valley. We fully support the demolition of obsolete MFH and construction of new units on existing sites. Implementation of the proposed action would result in the loss of 112 acres of undeveloped lands, effectively reducing permeable surfaces and the habitat base for these as well as other Mojave Desert species. If limiting the project to previously disturbed areas is not feasible, we recommend implementation of Alternative 1, which proposes to leave the 26-acre parcel adjacent to Manch Manor II and III intact. This alternative would protect the habitat suitable for the Las Vegas bearpoppy and occupied by the Las Vegas buckwheat, and provide important opportunities for habitat restoration.

For any activities that may affect State-listed species or their habitats, a special permit must be obtained from the Nevada Division of Forestry (NDF). As stated previously, the Las Vegas bearpoppy is fully protected by the State of Nevada and the Las Vegas buckwheat has been proposed for listing under State regulations. Please contact Margie Klein or Mark Hill of NDF at (702) 486-5123, 4747 W. Vegas Dr., Las Vegas, Nevada, for guidance on permitting requirements and potential mitigation and/or compensation measures.

We met with staff from Nellis AFB and NDF on March 12, 2004, at the 26-acre and 86-acre parcels proposed for development to discuss potential mitigation measures. Based on our discussions with NDF and depending on which alternative is selected, we recommend the following mitigation and compensation for the loss of any occupied and potentially suitable habitats for Las Vegas bearpoppy and the Las Vegas buckwheat:

- Prior to construction, seeds should be collected from Las Vegas buckwheat individuals that currently occupy both parcels. If possible, seeds should be collected over multiple years until construction occurs. Please coordinate with NDF, as they may be able to provide crews to conduct this work, and they can ensure that the appropriate collection techniques are employed. The seeds should be donated to NDF for use in future restoration efforts around the Las Vegas Valley. Contact Margie Klein or Mark Hill of NDF at the phone number and address above for assistance.
- Prior to construction, the topsoil from the 26-acre parcel and suitable habitat within the 86-acre parcel (if the proposed action is implemented) should be salvaged and donated to the Las Vegas Springs Preserve. This contribution will assist the Preserve in constructing rare plant habitat as part of a series of interpretive exhibits designed to highlight the sensitivity of several plant and animal species that occur in the Las Vegas Valley. Please contact Von Winkel of the Preserve at (702) 822-8539, 1001 S. Valley View Blvd., Las Vegas, Nevada, for assistance in facilitating this effort.
- Because of the continued losses of Las Vegas bearpoppy and Las Vegas buckwheat habitats in the valley, we also recommend that the conservation area currently established be expanded to include the adjacent suitable habitat contained within the 86-acre parcel. This would remove a negligible number of acres from the proposed project area for Manch Manor IV, but this action would protect contiguous habitat that would benefit both of these sensitive plant species.
- If Alternative 1 is selected and the 26-acre parcel is left undeveloped, we recommend that the northwest portion of the MFH that is currently part of Manch Manor II and slated for demolition, be restored in an effort to reestablish the Las Vegas bearpoppy and Las Vegas buckwheat in this area. This action would provide additional habitats for these species to expand their already declining populations.

Mr. Robert Lopez

File No. 1-S-04-TA-455 and AF 6

We appreciate the opportunity to work with the staff from Nellis AFB on this proposed project and are available to provide technical assistance on any of the recommended mitigation/compensation measures identified herein. We also look forward to working with you on future conservation activities on Nellis AFB and the Nellis Test and Training Range as they relate to our trust resources. Please feel free to contact me or Jody Fraser at (775) 861-6300 if you have any questions.

Sincerely,

Cynthia T. Martinez

for Robert D. Williams
Field Supervisor

cc:

Regional Forester, Southern Region, Nevada Division of Forestry, Las Vegas, Nevada
Las Vegas Valley Water District, Las Vegas Springs Preserve, Las Vegas, Nevada
(Attn: Von Winkel)



KENNY C. GUINN
Governor

SCOTT K. SISCO
Interim Director

STATE OF NEVADA
DEPARTMENT OF CULTURAL AFFAIRS
Nevada State Historic Preservation Office
100 N. Stewart Street
Carson City, Nevada 89701

March 22, 2004

RONALD M. JAMES
State Historic Preservation Officer

Mr. Robert Lopez
Department of the Air Force
HQ AFCEE/TDG
3300 Sidney Brooks
Brooks City-Base, Texas 78235-5112

RE: Draft Environmental Assessment (EA) for the Military Family Housing Revitalization Project at Nellis Air Force Base (AFB), Nevada

Dear Mr. Lopez:

The Nevada State Historic Preservation Office (SHPO) has reviewed the draft EA referenced above. We offer the following comments:

- 1) Section 3.4.6.2 of the EA states that the SHPO has concurred with the final inventory and evaluation of historic structures on Nellis AFB. The final inventory mentioned was completed in 1988 and was for certain World War II-era resources only (SHPO letter 14 June 1991). Since the proposed project will impact buildings constructed after the war and are now 50 years old or older, additional inventory activities should be undertaken.
- 2) The Advisory Council on Historic Preservation provided Program Comment to the Department of the Army on Capehart- and Wherry-era resources. The Program Comment provides for mitigation on such resources when they are to be impacted by Army activities. The SHPO recommends an inventory of Wherry- and Capehart-era housing at Nellis AFB to be affected by the proposed project and evidence that the Air Force has adopted the terms of the Program Comment.

If you have any questions regarding this correspondence, please contact Mella Rothwell Harmon at 775-684-3447.

Sincerely,

A handwritten signature in black ink that appears to read "Alice M. Baldrica".

Alice M. Baldrica, Deputy
State Historic Preservation Office



STATE OF NEVADA
DEPARTMENT OF CULTURAL AFFAIRS

Nevada State Historic Preservation Office
100 N. Stewart Street
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CEVN -
Note asterisk
below.

KENNY C. GUINN
Governor

SCOTT K. SISCO
Interim Director

RONALD W. JAMES
State Historic Preservation Officer

October 5, 2004

Ms. Eloisa V. Hopper
Chief, Environmental Flight
Department of the Air Force
99th CES/CHV
4349 Duffer Drive, Suite 1601
Nellis Air Force Base, Nevada 89191-7007

Re: Wherry and Capehart Housing on Nellis Air Force Base, Clark County, Nevada

Dear Ms. Hopper:

The Nevada State Historic Preservation Office (SHPO) has reviewed the report *Wherry and Capehart Housing Historic Building Inventory and Evaluation, Nellis AFB*, submitted in satisfaction of the Section 106 of the National Historic Preservation Act of 1966, as amended. According to your letter of 15 September 2004, the Air Force is proposing to demolish 336 Wherry structures and 113 Capehart houses, built at Nellis Air Force base from 1950 to 1960. The report provides a historic context for the Wherry and Capehart housing programs as they were carried out at Nellis, and an evaluation of National Register eligibility for the remaining resources.

The Wherry properties were built between 1950 and 1957 and were evaluated under National Register criteria A through D. The report recommends the Wherry not eligible under any of the criteria. The SHPO believes the Wherry resources are likely eligible under Criterion A. However, over the course of the past 40 years, significant modifications have been made to the buildings, including window replacements and re-roofing projects that have compromised the historic integrity of a number of the buildings. The Wherry housing units were also evaluated as a historic district, but among other changes, the demolition of 454 Wherry buildings between 1998 and 1999 severely compromised the integrity of the layout and landscaping design. Please provide the SHPO with rationale regarding your decision to demolish these buildings without consulting with our agency.

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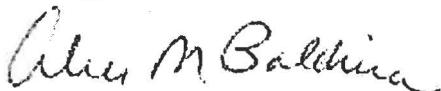
The 113 Capehart buildings at Nellis were built in 1960. As such, they are less than 50 years in age and in addition to being evaluated under criteria A-D, Criteria Consideration G was applied to each Capehart resource. The report recommended that the Capehart buildings failed to meet the exceptional significance requirements of Criteria Consideration G, which is in keeping with determinations made in a Program Comment issued by the Department of the Army regarding their Capehart resources.

Hence, the SHPO concurs with the Air Force's determination that the Wherry and Capehart resources at Nellis Air Force base are not eligible for listing in the National Register of Historic Places. As such, the SHPO would concur with a determination of *No Historic Properties Affected* for the subject undertaking.

The Department of the Air Force has completed its Section 106 consultation (National Historic Preservation Act of 1966, as amended) with this office for the subject undertaking. If previously unidentified resources are located during project activities, or if the scope of work does not follow that described above, SHPO recommends that all work cease and this office be contacted for additional consultation.

If you have any questions concerning this correspondence, please call Mella Harmon, Historic Preservation Specialist at 775-684-3447.

Sincerely,



Alice M. Baldrica, Deputy
State Historic Preservation Officer

AMB/mrh



DEPARTMENT OF THE AIR FORCE

99TH CIVIL ENGINEER SQUADRON (ACC)

NELLIS AIR FORCE BASE, NEVADA 89191

Ms. Eloisa V. Hopper
Chief, Environmental Flight
99 CES/CEV
4349 Duffer Drive, Ste 1601
Nellis Air Force Base, NV 89191-7007

26 Oct 2004

Ms. Alice Baldrica
Deputy State Historic Preservation Officer
State Historic Preservation Office
100 North Stewart Street
Carson City NV 89710-4285

Dear Ms. Baldrica

This is in reply to your letter dated 5 Oct. 2004 requesting a rationale why Wherry houses, constructed in 1950 on Nellis Air Force Base, were dismantled in 1998 and 1999 without consulting your office. The U.S. Department of Defense has taken efforts to treat this type of housing on a national scale while allowing for local evaluations. In 1998, the U.S. Army published *For Want of a Home: A Historic Context for Wherry and Capehart Housing.*" The U.S. Army considered Wherry and Capehart houses on a national scale as not significant. The U.S. Air Force also determined this structural type did not meet the criteria of exceptional significance according to 36 CFR 800.3(a) (1), thus having no potential to affect historic properties. The Nellis Air Force Base houses, then less than 50 years old, were demolished following the determinations.

The Advisory Council on Historic Preservation published a Program Comment in the 7 Jun 2002 *Federal Register* on the U.S. Army's proposal to treat Wherry and Capehart Housing. In Section III (1) the Advisory Council on Historic Preservation provided guidance for evaluation and treatment. In 2004, Nellis Air Force Base conducted an inventory and evaluation of Wherry and Capehart buildings proposed for demolition. A determination of ineligibility for nomination to the National Register of Historic Places for the structures was submitted to your office in a letter dated 15 Sep. 2004, with your concurrence on 5 Oct. 2004.

Attached are revised copies of page 4 of each of each site record with the National Register Eligibility as *ineligible*. If you have questions please contact Mr Keith Myhrer, Nellis Air Force Base Archaeologist, 99 CES/CEVN (702) 652-9365 or E-Mail: keith.myhrer@nellis.af.mil.

Sincerely


ELOISA V. HOPPER
Chief, Environmental Flight

Attachment:
Records forms – eligibility page (11 forms)